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ABSTRACT

A study investigated the effects of the language used by native-English-speaking teachers on limited-English-proficient (LEP) students' opportunities to participate in classroom discussions. Three experienced secondary school science teachers were observed, interviewed, and videotaped over a period of a year. Each classroom contained 3-4 LEP students mainstreamed from bilingual programs. Selected LEP students were also interviewed. Classroom talk about science was transcribed; teacher utterances were coded and analyzed to assess differential distribution of speech act types. Results indicate differential use of utterance types. Teachers gave LEP students more directives to action than English-proficient students. In full class discussions, LEP students received fewer elicitations. Questions to LEP students were on a lower cognitive level and more frequently closed- than open-ended. However, teachers called on LEP students who had not volunteered more often than on non-volunteering English-proficient students and in lab settings, directed more answers-unknown questions to LEP students. Overall differences resulted in reduced opportunities for LEP students to participate in science discussions. Compensatory teaching strategies are recommended. Appendixes include coding for initiation, response, feedback names and acts and coding instructions. Forty-one tables are included. (MSE).

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ED 390 254

BOSTON UNIVERSITY

GRADUATE SCHOOL

Dissertation

DISCOURSE MODIFICATIONS IN TEACHER INTERACTIONS WITH LIMITED ENGLISH PROFICIENT STUDENTS IN CONTENT CLASSROOMS

by

LORETTA SUSAN STOOPS VERPLAETSE

B.A., University of Illinois, 1971
M.S. Ed., Syracuse University, 1974

Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy
1995

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Approved by

First Reader

Mary Catherine O'Connor, Ph.D.
Assistant Professor of Education
Boston University

Second Reader

Maria Estela Brisk, Ph.D.
Associate Professor of Education
Boston University

Third Reader

Catherine Snow, Ph.D.
Henry Lee Shattuck Professor of Education
Harvard University

This work is dedicated to Christopher James Verplaetse –
a brilliant thinker, a true American humorist, a dear friend,
and my son.

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This dissertation has not been created in isolation; it is the result of many people who have contributed their thoughts, their critiques, their support and their prayers. It is a joy for me now to acknowledge so many who have contributed so much.

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responsible for my first graduate school TESOL teaching experience. It is only fitting that she see me through the final stages of my doctoral studies. I am grateful that she was a part of this committee.

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DISCOURSE MODIFICATIONS IN TEACHER INTERACTIONS

WITH LIMITED ENGLISH PROFICIENT STUDENTS

IN CONTENT CLASSROOMS

(Order No.)

LORETTA SUSAN STOOPS VERPLAETSE

Boston University, Graduate School, 1995

Major Professor: Mary Catherine O'Connor, Assistant Professor of Education

ABSTRACT

It is widely assumed (Long 1983, Chaudron 1988) that native speakers (NS) modify their language in talk to non-native speakers (NNS), and that these modifications are beneficial for NNS language learning. In contrast, Verplaetse (1993) found that some native speaker modifications can have detrimental effects on NNS participation in NS-NNS conversation, thus lessening opportunities for language production, a crucial part of second language learning. Participation in talk is particularly crucial in school settings, where students are expected to develop communicative competence in academic discourse. This study thus explores the effects of native speaker (NS) teacher input on opportunities for limited English proficient (LEP) students to participate in science classroom discussions.

Three experienced science teachers (grades 7-12) were observed, interviewed, and videotaped 4-6 times over one year. Each classroom contained 3-4 LEP students who had been 'mainstreamed' from bilingual programs. Selected LEP students were also interviewed. Classroom talk about science was transcribed; teacher utterances were coded using a

modification of Sinclair & Coulthard's (1975) classroom discourse code, then analyzed to assess differential distribution of speech act types.

Findings indicate differential use of utterance types. Teachers gave LEP students more directives to action ($p<.05$) than English proficient students received. In full class discussions, LEP students received fewer elicitations ($p<.01$). Questions to LEP students were lower cognitive level ($p<.001$ for two teachers) and more frequently closed rather than open-ended ($p<.01$ for two teachers). However, teachers called on LEP students who had not volunteered more often than non-volunteering English proficient students and, in lab settings, directed more answer-unknown questions to LEP students ($p<.05$ for two teachers). Overall, differences resulted in reduced opportunities for LEP students to participate in science discussions.

Teachers' unconscious modifications in talk to LEP students thus may frequently limit those students' opportunities for extended participation in discussions supporting decontextualized, higher-order reasoning. Proposed explanations for teachers' modifications include: 1) teachers' misperception of students' real language abilities, due to students' classroom performance and given the context specificity of language competence, 2) curricular and interpersonal time constraints, and 3) intention to shelter students from embarrassment. Compensatory teaching strategies are recommended.

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George Washington High School was the first real school I attended. My entire stay there might have been time lost if it hadn't been for the unique personality of a brilliant teacher. . .

Miss Kirwin never seemed to notice that I was... different. I was Miss Johnson and if I had the answer to a question she posed I was never given any more than the word "Correct," which was what she said to every other student with the correct answer.

I often wondered if she knew she was the only teacher I remembered.

Maya Angelou
I Know Why the Caged Bird Sings

Chapter 1. INTRODUCTION

Two years ago, in October, 1992, a conference was held, "Educating Students from Immigrant Families: Meeting the Challenge in Secondary Schools," sponsored by the National Center for Research on Cultural Diversity and Second Language Learning. The purpose of this conference was to explore what is now known and unknown about educating this country's immigrant, linguistic minority adolescents. Two quotes from this conference set the scene for this present study. Laurie Olsen, Executive Co-Director of California Tomorrow, defined being limited in one's English proficiency as a "social disability," claiming that the social separation "also reflects an institutional separation."

> We are familiar with the systems that support this separation: the hidden curriculum which groups students ostensibly by ability and aspiration but results in separating them largely by race, culture and English-speaking agility. We are familiar with the curriculum which continues to marginalize the experiences and cultures of non-white students. . .We may be less aware of the effects of the increased use of sheltered content classes, which group LEP (limited English proficient) students with other LEP students for most of their school day. LEP students *are* separated - institutionally and socially. . .Their accents and foreign ways subject them to remaining outside. (Olsen, 1993, p.63)

Part of Olsen's message is that well-intentioned institutional efforts to support and develop linguistic minority adolescents still unwittingly result in differential treatments that diminish these students' roles in the educational process and deter their language and content learning opportunities. A second important message from the quote above is that the problem of successfully educating this country's linguistic minority students is multi-

faceted and extremely complex. There is no one easily identified problem source, nor solution.

Jim Cummins, in his keynote address at this conference attempts to define the single most important feature for this problem's resolution:

> . . .culturally diverse students are empowered or disabled as a direct result of their interactions with educators in schools. . .
> The micro-interactions between educators and students constitute the most immediate determinant of student academic success or failure. . .
> (Cummins, 1993, pp. 8,9)

The current study looks at such micro-interactions between teachers and immigrant students (grades 7 - 12) from a psycholinguistic perspective. Specifically it looks at how teachers, through their own teacher talk, facilitate or inhibit the LEP students' opportunities for interaction. Its focus is the mainstream content classroom – the final step in the bilingual student's linguistic and academic developmental transition. It is in the content classroom that, ideally, the mainstreamed LEP student can practice and perfect his/her academic English competence.

The problem: interaction and access to speech events

This study looks at the effect of native speaker (NS) teacher input on non-native speaking students' access to classroom speech events. It seeks to determine whether content teachers modify their talk when interacting with the non-native speakers (NNS) in the classroom. If modifications do occur, this study seeks to describe the modifications and to establish whether these modifications determine the level of interaction by NNSs in the classroom.

Current second language acquisition (L2A) theory claims that modified input by native speakers to non-native speakers is beneficial to second

language learners because the modifications facilitate comprehension and interaction. These NS modifications (reviewed in Chapter 3) facilitate comprehension by creating NS input that is understandable by the NNS hearer, and by selecting topics that are contextually based in the "here and now" or topics that are initiated by the NNS. These NS modifications facilitate interaction by providing the NNSs opportunities to answer more questions in easy, one-word response forms and by assisting the NNS in his/her speech turns (Freed,1980; Hatch, 1983; Long, 1981, 1983). This claim about the benefits of NS modifications is thought to hold true for second language (L2) development, whether it occurs in a natural setting or in the classroom (Chaudron, 1988).

Current L2A theory further recognizes the particular importance of NNS interaction in second language development. Interaction in the target language provides an opportunity for the NNS to create output in the target language, thus forcing the learner to manipulate structural (syntactic, morphological, phonological) components of the new language (Swain, 1985). Interaction also provides the opportunity for the NNS to practice these components, thus increasing the likelihood of automaticity of such components (Brown, 1991; McLaughlin, 1987).

Arguments supporting the importance of NNS interaction in L2A are based on linguistic perspectives that focus on the structural components of language up to and including the sentence. As the field of discourse analysis has matured, second language acquisitionists have had available to them another layer of language – a more macroscopic view of language structure from which to explore questions of language development. From this more

global perspective, interaction provides the opportunity for the NNS to negotiate and co-construct meaning, providing the learner with increased chances for comprehension of the target language (Gass & Varonis, 1985a; Pica, Doughty, & Young, 1986). Furthermore, interaction provides an opportunity for the NNS to acquire target discourse conventions (Hall, 1993; O'Connor & Michaels, 1993; Poole, 1992; Rosebery, Warren, & Conant, 1992).

Although it is clear that interaction with NSs can greatly facilitate a learner's L2 acquisition, many NNS students in American schools have little access to interaction with native English speakers. Classroom research exists (Early, 1985; Green, 1992; Schinke-Llano, 1983) and anecdotal evidence abounds to support the claim that students who are NNSs of English interact significantly less in integrated content classrooms than do their native English speaking counterparts. Anecdotal evidence also supports the claim that students who are NNSs of English interact significantly less overall once mainstreamed into integrated content classrooms than they did in ESL/bilingual classrooms where they were not linguistic-minority students.

There is a perception by educators and educational researchers that the primary factor which causes this reduced participation in speech events is the limited language competency of the NNS student. Consequently the perceived solutions belong primarily to the learners of the second language and their teachers. The language learner must gain sufficient command of the target language to enable him/her to access target speech events. The second language teacher offers instruction on the structural and communicative elements of language, providing L2 students with sufficient focus and practice, so that they acquire the necessary target language needed to

access and to participate in their new target speech communities (Brumfit & Johnson, 1979; Crandall, 1987; Finocchiaro & Brumfit, 1983; Olsen, L, 1993; Saville-Troike, McClure, & Fritz, 1984). Researchers support the learners' and teachers' efforts by seeking to identify what exactly constitutes "academic language" and what strategies second language educators might use to best prepare their L2 students in academic language competence.

Access to a target speech event, however, in particular the classroom speech event, is not dependent solely on the proficiency of the language learner (Schinke-Llano, 1983). The NS, too, plays an important part in determining the interactive role of the NNS, particularly in the classroom event, where the teacher is the determiner of all interaction. It is possible that features might exist within the NS's input which play a causal role in the NNS's reduced participation. Our knowledge of NS input at the discourse level is relatively limited. This literature has focused primarily on repair moves in NS-NNS and NNS-NNS talk, both in and out of the classroom (see Pica, 1987, for review) and on questioning patterns or turn allocations in the classroom (Allwright, 1980; Philips, 1983; Tobin & Gallagher, 1987; van Lier, 1988). Otherwise the NS input literature describes the structural features or functions of components no larger than the sentence. (See Chapter 3 for a detailed discussion.) This study seeks to expand our knowledge of NS input to NNSs – at the discourse level – by looking for modifications in NS discourse conventions. The study further seeks to determine whether any modifications found might have prohibitive consequences for NNS interaction.

A few preliminary studies suggest that NS input does contain discourse features that inhibit the NNS's interaction and reduce the participatory role of the NNS interlocutor (Shea, 1993; Verplaetse, 1993). These studies are not of classroom talk, however; they are of NS-NNS talk in natural conversation settings. Early descriptive studies of NS teacher talk in the content classroom (Early, 1985; Green, 1992; Musumeci, 1994; Schinke-Llano, 1983) provide further evidence of modifications, specifically: limited questions addressed to NNS students; restricted use of question types, such as open-ended vs. closed; and the differential distribution of types of interaction, that is, talk about content vs. talk about classroom management. Therefore, preliminary research provides reason to question whether more subtle NS modifications in the discourse might exist in NS teacher talk and, hence, whether one consequence of such modifications may be reduced NNS access to classroom speech events.[1]

General assumptions about teacher talk and students of other cultures

As I have already stated, it is generally assumed that NS modifications in the input facilitate L2 learning. These modifications are seen as facilitative because they enhance the comprehensibility of the input. Furthermore, they are thought to enhance the NNS's access to interaction, thus providing the speakers with expanded interactive opportunities.

A second assumption that has produced a large body of literature is that discourse styles vary among peoples of varying cultures; hence the discourse

[1] The author recognizes that there are numbers of factors which determine the production of interaction, such as classroom organization, varying cultural styles of discourse, personality differences, etc. This study focuses on one determiner - the nature of teacher input.

style of the white, middle-class American teacher may differ in important ways from the discourse styles of her multi-cultural students (Cazden, 1988; Green & Wallat, 1981; Gumperz, 1982a, 1982b; Heath, 1986; Irujo, 1988; Michaels, 1981; Philips, 1983). This cultural mismatch has caused differential treatment by teachers "in ways that may reinforce, even increase, inequalities of knowledge and skills that are present when students start school" (Cazden, 1988, p. 81).[2] This cultural mismatch theory is taught to prospective teachers under the assumption that such awareness of mismatches will allow teachers to respond to discourse styles dissimilar to their own in new ways. With such an awareness teachers can learn not to evaluate negatively performances which they do not understand without considering the possibility that the performances are competent but in an unfamiliar style. Furthermore, with such an awareness teachers might alter their own instructional practices in ways that would allow them to be more culturally inclusive.

Given these assumptions, one could conclude that the ideal teacher, who recognizes and accepts the dissimilar discourse styles of her students, who has altered her own instructional patterns to better reflect and include those discourse patterns of her students, and who naturally modifies her NS input to enhance NNS comprehension and interaction, this ideal teacher is doing all that she can do to ensure an interactive speech environment for her

---

[2] This cultural mismatch theory is one of three major schools of thought regarding the performance of cultural/linguistic minorities in American classrooms. Another perspective addresses the problems of the linguistic minorities as a language learning problem. According to Zanger (1991), "Cummin's early research (1981) has been used for a decade to argue that bilingual instruction is the best way to promote language minority students' linguistic and cognitive development and academic achievement" (p.3). The third perspective seeks to explain why some groups of linguistic minority students excel while others fail. Proponents of this perspective identify the problems of linguistic minority students as psychological caused by social and political inequities (Gibson & Ogbu, 1991; Ogbu & Matute-Bianchi, 1986).

NNS students. It has not yet been considered that this same ideal NS teacher may also unwittingly be modifying her own input at the level of discourse conventions when interacting with NNSs in ways that determine their level of participation. It is the possibility of these subtle, unknowing NS discourse modifications that this study is designed to consider.

The research questions

This research asks whether discourse modifications exist in NS teacher talk to NNS students and if so, whether such modifications affect the NNS students' interaction opportunities. It is a study of teacher talk in the content classroom. The teachers are all native speakers of English with classrooms containing bilingual, LEP[3] students and English proficient (EP) students. By "English proficient" I am referring to both students who speak English as a first language and those bilingual students who speak English with native-like fluency, i.e., the teacher has not designated these bilingual students as "limited" or "in language transition" in any way. In this study I attempt to

---

3 At this point I switch my terminology from linguistic minority student and non-native English speaking student to LEP student. This is done intentionally to make a distinction between the students I will be studying and the bilingual student who has assimilated into the classroom speech community sufficiently enough that s/he is no longer seen by the teacher as "in transition" or still language limited in some way. I want to look at how teachers may modify their talk with the bilingual students whom they determine are still "in transition", i.e. those students whom they define as marked by accented speech and still limited in some way in their abilities to exchange ideas in the English language. In this change of terminology, I am aware, however, that the term LEP, though in its literal meaning denotes a limitation only in English, more generally connotes an overall limitation, and in so doing may perpetuate the unhealthy perception that the bilingual students in transition are deficient in some way, rather than focus on the truth that these bilingual students (by the fact that they speak more than one language) bring to the classroom greater language ability than their monolingual counterparts. Some would argue that they also bring greater cognitive capabilities because of this bilingual competence. For full discussions on this issue see Bialystok, 1991; Cummins, 1981; Hakuta, 1986; Lambert, 1977; McLaughlin, 1985; Zanger, 1991.

identify and describe particular discourse conventions used by individual teachers. Then I determine whether these conventions are altered in any significant way when the teacher is interacting with the LEP students. Finally I explore whether these modified conventions may affect – either positively or negatively – the students' opportunities to participate in the interaction. In general, I explore what native English speaking (NS) content teachers do through their talk to facilitate or to inhibit the interactive role of their LEP students. By interactive role, I mean the students' verbal interactions in the classroom and the students' interaction with the course content.

This research builds from the work of Verplaetse (1993), an analysis of adult NS input in casual conversations with other NSs and with NNSs, which is discussed in detail in Chapter 3. In this work Verplaetse found that certain NS modifications hinder the NNS's participatory role in the speech event. The observed modifications a) reduced the NNS's opportunities to speak by hindering the NNS's co-construction of the text, and b) limited the opportunities to establish rapport by restricting the use of personal detail – "the exchange of relatively insignificant details about daily life. . .valued for its metamessage. . .of caring" (Tannen, 1989, p. 149). One affective consequence of these NS modifications may be a reduction of face. Specifically, the NNS's positive face needs, those needs to be understood, approved of, liked, or admired (Brown & Levinson, 1978, 1987), may be insufficiently ratified. The questions for this research project are derived from this earlier work and continue to focus on the issues of opportunities to speak and positive face needs. Therefore, the research questions and the empirical procedures to answer these questions are:

1. Do NS teachers interact with their EP and LEP students differently? Specifically, do teacher's discourse strategies which facilitate or inhibit a student's opportunities to talk as frequently and as purposefully as his/her classmates differ for EP and LEP students?

a. This study questions whether EP and LEP students are asked to participate in differing manners and at differing cognitive levels. The length of student responses to particular teacher acts are compared by assessing the mean number of words per turn. This assessment determines which teacher acts initiate more student participation and which generate less participation. These acts are then analyzed for differential distribution. The cognitive levels of the content questions[4] directed to LEP students and to EP students are compared.

b. This study further questions whether the teacher provides the same opportunities for interaction based on question types. The percentage of open and closed questions asked to EP and LEP students is compared.

c. The allocation of turns is analyzed for proportionality between LEP students and EP students.

2. Do NS teachers ratify the positive face needs of their EP and LEP students differently? Specifically, do a teacher's discourse strategies which function to indicate interest in students' thoughts, in their comments, and in the students, themselves differ for EP and LEP students?

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[4] While I am using the word "question", I do not want to limit this term to its grammatical definition. Rather, I am using the word "question" to include any teacher utterances that would function as what Sinclair and Coulthard (1975) describe as elicitation acts which elicit student responses.

a. This study attempts to describe the nature of teacher scaffolding; it determines whether the fullness of teachers' reactions[5] to student responses differs for EP and LEP students. The frequency of these teacher reactions, the acts used to instantiate these reactions, and the cognitive levels of these teacher reactions are analyzed for differential treatment.

b. Given that the use of personal detail is said to enhance rapport in casual conversation, this study explores the teachers' use of personal detail in class discussion. Furthermore, given that sincere questions, i.e. those questions to which the answer is unknown, may indicate interest in a student's personal thoughts, this study analyzes the teachers' use of display (answer-known) and referential (answer-unknown) questions. The frequencies of use of personal detail and use of display vs. referential questions are computed to determine whether there is differential use of these features for LEP and EP students.

c. Also explored is whether the teacher uses non-reaction or minimal reaction to a student's utterance as a discourse strategy. The frequency of teacher non-responses to student questions when the student has the floor is computed to determine if there is differential use of this feature for EP and LEP students.

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[5] By the term "reaction", I mean any of the moves that Sinclair & Coulthard (1975) would describe to be "feedback exchanges"; those follow-up moves in reaction to student responses, to include acts of accepting, evaluating, and commenting. I also include in this category any teacher questions produced in reaction to incorrect or insufficient student responses and teacher questions produced in reply to a student's question. I will discuss the reasoning behind this categorization in full detail in the Methods Chapter.

3. If discourse strategies differ for EP and LEP students, why are such modifications occurring? I discuss a range of possible explanations and evaluate them in light of post-taping interviews and transcript data.

These questions will be reviewed and further explicated in Chapter 4, after a discussion on the coding system.

Significance of the study

This research is designed to inform both theory and practice. It is the intent of this study to provide:

1) an expanded vision of NS input/modification, in particular NS teacher input in the classroom;
2) an increased understanding of specific discourse challenges facing the L2 learner and of the consequent strategies L2 learners need to access target speech communities, in this case, the integrated content classroom[6];
3) a more detailed account of conscious strategies NS content teachers may utilize to create more interactive environments in their monolingual, integrated classrooms; and
4) a more precise description of the language challenges and, hence, learning challenges facing mainstreamed bilingual students during their period of transition.

[6] The term "integrated" is used here because it is the term used by the teachers and administrators in the schools observed. It is used to mean a classroom which contains students with a variety of needs, including linguistic minority students and special education students.

Additionally, this study may offer one more piece to the puzzle as the American school system struggles to determine how better to educate linguistic minority students.

Study overview

This study is an analysis of native speaker teacher talk and its potential effects on the interactive role of limited English proficient students in the content classroom. This work explores the existing claim that NS modifications are beneficial to the NNS. Building from the findings in Verplaetse (1993) this research asks whether NS teacher discourse strategies are modified in NS teacher talk to LEP students; and if found, do such modifications have an effect, either beneficial or detrimental, on the LEP students' opportunities to speak as frequently and as purposefully as their EP classmates. Furthermore, this research asks whether and how discourse modifications, if found, may define the LEP student's role in the classroom and ratify the LEP student's contributions to class discussions. Finally, if modifications are found in NS teacher talk to LEP students, possible explanations for these modifications will be evaluated in light of post-taping interviews and transcript data.

This work covers the following topics in chapter form:

Chapter 1. Definition of the problem; The research questions

Chapter 2. Importance of interaction

Chapter 3. Review of the literature

Chapter 4. Research methodology

Chapter 5. Findings: Teacher A

Chapter 6. Findings: Teacher B

Chapter 7. Findings: Teacher C

Chapter 8. Discussion of findings; Implications for educators

Chapter 2. IMPORTANCE OF INTERACTION

If we are to explore how NS teachers affect NNS student interaction, it is appropriate to first ask how interaction is important to a student's development. This chapter first discusses the role of communication in the classroom event. Next, it expands on the notion of communicative skills, with a particular focus on discourse conventions. Then it addresses the importance of interaction to:

1. content learning;
2. the development of higher level academic communicative skills;
3. students' social role definition.

Finally, this chapter returns to the major premise of this research paper and raises a question about a teacher's consistency in the use of discourse conventions and how inconsistency might interfere with students' interactive abilities.

Communication in the classroom event

"Curriculum...is tripartite in nature; it is composed of academic, social, and communicative demands" (Green & Harker, 1982, p. 183). According to Green and Harker, the acquisition of the social and communicative strategies needed to gain access to the content are acquired simultaneously during the learning of the academic content. This echoes the thoughts of Mehan from a decade earlier, "To be successful in the classroom, students must not only master academic subject matter, but also learn the appropriate form in which

to cast their academic knowledge. Classroom competence thus involves matters of form as well as content" (Mehan, 1978, p. 49).

This realization that successful academic performance requires not only competence in the academic task, but also competence in the language strategies required to deliver and receive the academic task has motivated research to look at the combined aspects as mutually constitutive (Erickson, 1982). If we are to truly understand the nature of teaching and learning, research must systematically describe the social and language processes that are occurring in the classroom (Green & Wallat, 1981). Hall (1993) points out that because this dual perspective has been missing in second language acquisition research, "the result is that learners of another language operate in an interactive world that is ill-defined and therefore not easily manipulated. They are uncertain of the constitutive interactive elements of oral practices, of how the various elements coalesce in any given situation, and of the important social and cognitive functions associated with these practices" (p. 157).

Given the tripartite nature of the classroom event, this study focuses on the latter two skills, the social and communicative skills and examines how interaction is realized by the NNS students in the classroom. Before discussing the importance of interaction, we must first look in detail at what is meant by communicative skills.

Communicative skills - competence and performance

The communicative skills required to successfully involve oneself in academic course content are considered to be more linguistically challenging

than interpersonal conversational skills (Cummins, 1981). While Cummins' original distinction between BICS and CALP (Basic Interpersonal Skills and Cognitive-Academic Language Proficiency) has been subject to considerable challenge (Rivera, 1984), his revised framework analyzes the distinction into two dimensions: high vs. low cognitive demand[1] and high vs. low context embedding (Cummins, 1984). Chamot and O'Malley (1987) claim that the development of the higher level academic communicative skills lags behind the development of basic interpersonal communicative skills by five to seven years. What exactly comprises "academic language" is yet to be satisfactorily defined and is currently a major research topic within the Center for Applied Linguistics (Rhodes & Solomon, 1994). The classroom literature often refers to these skills as communicative competence in academic discourse.

This paper discusses next the meaning of communicative competence, the importance of discourse conventions and participant structure in communicative competence, and the distinction between competence and performance. It is performance that realizes interaction.

Communicative competence

Hymes claims that communicative competence (Hymes, 1974) is a prerequisite for academic achievement. Cook-Gumperz and Gumperz (1982) explain communicative competence as follows:

> The notion of communicative competence was originally proposed by sociolinguists to account for the fact that, to be effective in everyday social settings, speakers and listeners depend on knowledge that goes beyond phonology, lexicon, and abstract grammatical structure. Language usage, they

[1] It should be noted that in Cummins' writings no distinction is made between the cognitive demands required to process the language vs. the cognitive demands required to process the content. Until we get clearer definitions of what exactly comprises "academic discourse" this distinction will be difficult to explicate. Nevertheless, the distinction needs to be made.

> argued, is governed by culturally, subculturally, and context-specific norms, which constrain both choice of communicative options and interpretation of what is said (p.13).

They go on to explain how the concept "competence" is in sharp distinction to the concept "performance" according to theories of generative grammar. "Competence" is abstract knowledge about grammaticality of sentences and structural relationships among sentences. "Performance" is what is actually said at a given time; this is subject to variability due to personal choice and individual variation. Competence is not. They continue, citing Hymes, 1974:

> By applying the term competence to communication rather than to languages as such, ethnographers of communication advance the claim that there exist measurable regularities at the level of social structure, and social interaction, which are as much a matter of subconsciously internalized ability as are grammatical rules proper. Control of these regularities, they contend, is a precondition of effective communication (p.14).

This communicative competence has been described in a variety of ways. Bellack, Kliebard, Hyman, and Smith (1966) compare learning to participate in various language activities to playing a game and learning the rules of the game in order to play the game successfully. Gumperz (1981) refers to it as conversational involvement, citing Goffman (1974) and discussing how children must be able to recognize and follow the subtle shifts in the focus and maintenance of such involvement. Kramsch (1985) refers to those interactional skills needed to manage and control the discourse of self and others as skills often underestimated by the L2 learner in deference to the more obvious L2 structural skills. Snow (1992) describes this proficiency according to the developmentalists as "the ability to be communicatively effective in the tasks one must carry out" (p. 17). Erickson (1982) stresses the learner's need to be able to "'read' the signal system of contextualization cues" (p. 159) as a crucial aspect of appropriate and effective communication.

This communicative competence is the ability to navigate not only the phonological, morphological, syntactic, and semantic elements of a sentence. Communicative competence is also the ability to navigate the rules or regularities of the discourse. Such regularities are realized by contextualization cues (Gumperz, 1977) – the structural, surface discourse conventions by which speaker intent and shifts in speech events are signalled.

Discourse conventions, participant structures, and competency

The study of discourse conventions has led us to an understanding of varying speech events and how event shifts are signalled. Individual speech events contain conventional configurations that regulate the interlocutors' roles within that speech event, that is, the interlocutors' rights and obligations among various interactional partners in the event. These configurations that mark uniquely one speech event from another can include use of pace, pitch, use of verbal routines, shifts in verbal patterns, changes in space and body language. Such conventional configurations are called social participant structures (Erickson & Schultz, 1981; Erickson, 1982; Philips, 1972). Erickson and Schultz (1981) point out that within a single class lesson, one may find a series of participant structures; for example: a question and answer review event, a story-telling session, and a clean-up/closing period. With each participant structure comes a new set of rules for paying attention, attaining the floor, answering appropriately, etc.

The attainment of communicative competence must, by definition, include the ability to identify/recognize varying participant structures and to utilize appropriate discourse conventions. These participant structures are

seen as rule based or regularity-based. But within the rules there may lie variation by various participants. For example, O'Connor and Michaels (1993) depict how one particular discourse strategy, "revoicing", is instantiated by two individual teachers in three varying ways. Hall (1993) refers to this variation within the rule-based structures as follows. She describes one's understanding of and ability to participate in an activity as "the function of one's shared history of interaction with a group of interactants. Furthermore, it is an understanding that is based less on rules and more on a set of shared habits of preferences" (p. 148). Nevertheless, it is the regularity of verbal and non-verbal cues that marks the context of a participant structure. We will return to this concept of regularity at the end of this chapter.

To summarize the discussion thus far, the classroom event is tripartite in nature, requiring content task skills plus social and communicative skills. Communicative competence is the mastery of all those inferred rules/ regularities of the language game, necessary for full comprehension of the event. Among the regularities are those discourse conventions which distinguish one speech event from another and participant structures which define the participatory roles for those partaking in a given event.

Performance – the role of participation

What has not been discussed up to now is the role of performance. The acquisition of communicative competence allows the acquirer access to a speech event, but only in a passive role. If the acquirer chooses to be an active participant, then s/he must be able to perform, that is, exhibit through oral practice, those competencies which s/he possesses. It is through participation in interaction that performance takes place. Therefore, it is appropriate to

consider next the importance of interaction in the learning event. To discuss this in any meaningful way a distinction must first be made between the importance of interaction in the learning of academic content and the importance of interaction in the acquisition of academic communicative skills.

Interaction and content learning

This study makes few claims regarding the role of interaction as it affects the learning of an academic task. Anecdotal evidence sufficiently bears out that students can remain relatively silent in the classroom and still achieve high grades. However, four studies do speak directly to this topic: 1) Redfield and Rousseau (1981) state that student achievement is increased when teachers ask more "higher-order" questions than lower. 2) In discussing the use of discourse conventions that create participant structure, Gumperz (1981, p.11) states that "...to the extent that learning is a function of the ability to sustain interaction, the child's ability to control and utilize these conventions is an important determinant of educational success." 3) Philips (1983) points out that students pay more attention to the classroom event when each has more opportunities to talk. 4) Flanders (1970) suggests that when classroom interaction shifts toward more attention to pupil ideas and more pupil initiation, that students have a more positive attitude toward their teachers and their subject matter; furthermore, subject matter learning is increased.

Additionally, van Lier (1988) points out that participation presupposes attention; and a basic tenet of the psychology of learning is that attention is a

prerequisite for learning (pp. 92,93). Van Lier goes on, however, to note that participation need not be overt; it can include internal talk.

Thus, there is minimal evidence that oral participation has direct effect on academic success. However, from a socio-cultural perspective, participation takes on an extremely important role in learning; in that, through interaction, students can assist in the co-creation of knowledge and the co-shaping of thought. In this perspective, it is believed that language, both internal and external talk, shapes thought. Educators who practice this perspective value a highly interactive classroom, believing that one student's expressed thought is further developed by another student's subsequent expressed thought, and so forth. Wertsch and Toma (1990) identify this type of classroom interaction as dialogic discourse and contrast it to univocal discourse. In a dialogic discussion, pupils treat utterances of their own and of others as thinking devices; these utterances become springboards for new questions and new ideas; they "interanimate" the voices of others (p.12). But this interanimation achieves more than just a verbally active classroom. Wertsch and Toma suggest that such co-construction of thought frames how students respond and act to thought internally. "We would expect that the styles of intermental functioning employed in classroom discourse will be reflected in subsequent intramental functioning" (p. 13). Hence, how a student experiences interaction may directly influence the thinking processes utilized by that student.

Collaborative thinking, such as that found in the dialogic classroom, is actually more like what real scientists really do when solving a problem. This is the claim of Rosebery, Warren, and Conant (1992) whose research has

helped to design highly participative, problem-solving oriented science classrooms (with a special emphasis on bilingual students). It is their claim that real scientific solutions are co-constructed through collaborative discussions. Given sufficient opportunities to take part in such discussions, students (including bilingual students) appropriate scientific behaviors and scientific talk.

Chaudron, too, speaks to the importance of the co-construction of talk (1988). He states that the meaningfulness for learners of classroom events depends on how much the communication has been jointly constructed between teacher and learner.

Consequently, while interaction may not be directly correlated to academic success, it is highly correlated to opportunities to collaboratively shape thought. Having explored how interaction affects content learning, I will now address how interaction affects acquisition of academic communicative skills.

Interaction and development of academic communication skills

How does a student develop the linguistically challenging academic communicative skills? Certainly part of the acquisition of these skills is the attainment of discourse conventions of varying participant structures. A student must be able to recognize/identify (at some level of consciousness or subconsciousness) varying participant structures and their corresponding requisite discourse conventions. Then, if the student wishes to participate, s/he must master the use of these conventions. This is done through

observation, participation, expert shaping and guiding, and practice (Green & Harker, 1982; Lantolf, 1994; Mehan, 1978; Wertsch & Toma, 1990).

Shaping and guiding

In shaping and guiding the course content, the teacher is also modeling and shaping the discourse conventions required to be a part of the speech event. Recall the tripartite nature of the academic event; as content is being developed, so too are communicative skills imparted. This study looks at shaping and guiding from one crucial perspective, the teacher's use of scaffolding techniques.

Scaffolding is a term first used by Ninio & Bruner (1978) to describe the "helping" of a child in that child's thought processes, moving the child forward in the learning experience by allowing the child to create as much as s/he can and then guiding that child to the next step of development. Erickson (1982) describes scaffolding from a discourse perspective:

> Changing the social participation structure so as to allow the child to answer along with another child, or with the teacher, gives the teacher observational access to what Vygotsky '78 terms the child's zone of proximal development - the range across which the child can perform successfully with help, as contrasted to the point at which the child's mastery stops when the child is performing the learning task alone (p.162).

Various distinctions have been made within the category of scaffolding. Cazden (1988) distinguishes between reformulating, reconceptualizing, and what Lemke (1990) calls recontextualizing. O'Connor and Michaels (1993) identify a particular scaffolding move as revoicing. Hatch (1978) first applied scaffolding to L2 studies in describing the vertical discourse sequence of turns used to create meaning. This study, too, makes clear distinctions of three types of scaffolding. One is reformulating – responding to a student's incorrect or insufficient reply. A second is the teacher replying to a student's

question with another question – reversing the direction of inquiry. A third type of scaffolding is leading the student further along on an existent pathway, to challenge the student to think further about a topic. Recall that it is in the shaping and guiding of the content that the teacher also models and shapes the discourse and provides opportunities for the student to participate in and practice the new discourse conventions.

Practice and participation

Contrary to what Cummins (1981) has claimed, Snow (1990) has shown that certain academic communicative skills in the first language do not automatically transfer sufficiently into the second language. Some academic communicative tasks (like the forming of definitions) are developmental skills that require practice over time, and through such practice improve.

If practice is, indeed, a necessary element to the development of particular academic speech events, than participation in the classroom interactions becomes crucially important for the L2 students. In Pica's words, "...the learning environment must include opportunities for learners to engage in meaningful social interaction with users of the second language if they are to discover the linguistic and sociolinguistic rules necessary for second-language comprehension and production" (1987, p. 4).

Building from the frameworks of Ochs, Vygotsky, and Wertsch, Hall (1993) makes the claim that "language acquisition is bound to the notion of oral practice and proposes that the ability to participate as a competent member in the practices of a group is learned through repeated engagement in and experience with these activities with more competent members of the group" (p. 148).

Chamot and O'Malley (1987) describe a three step process whereby language learners acquire complex procedural knowledge such as language. In this process, the first step is conscious application of the rules with frequent errors. By the third step, through considerable repeated practice, the learner has automated the rules to the point that the rules may no longer even be at the conscious state.

Summarizing the importance of interaction in the development of communicative skills, the student develops academic communicative skills by first identifying crucial discourse conventions of varying participant structures. This is done by observation. Then through participation, expert shaping and guiding, and repeated practice, the student develops the skills required to utilize those conventions.

Interaction and social role definition

While the student develops competence in the communicative skills, through ongoing participation, the student is also determining the role s/he will take within that interactive group. Kramsch (1985) states that the level of proficiency attained by L2 learners is directly related to group power that students can attain; that "control of group or dyadic interaction is largely due to the mastery of discourse or communicative strategies" (p. 173).

Zuengler (1993), in a concern about the "reduction" of the NNS warns that "whereas it is normal in interactions for speakers sometimes to participate less actively than their interlocutors, it is a matter of great concern if in fact NNSs tend to remain less active when interacting with NSs. There

may be negative effects on the NNSs, both affectively and acquisitionally" (1993, p. 405).

This echoes the thoughts of Brisk (1991) who in describing a model bilingual program, identifies one of the goals to be, "to have bilingual students participate in the English-taught classrooms as 'insiders' and not 'outsiders'" (p.19).

From a sociocultural perspective, ongoing interaction shapes a collective history shared by the interlocutors (Hall, 1993; Lantolf, 1994; Wertsch & Toma, 1990). By virtue of interacting students and their teacher create a social group.

Green & Wallat (1981) describe six social action rules for teacher/student in-group membership. Of these six, the final two are most important to this study: "5) Becoming a member of the group involves clear avenues of access. 6) Being a member of the group includes speaking rights and responsibilities" (p. 191). According to Green & Wallat, group cohesiveness occurs during a norming phase when interaction rights and responsibilities are established. These two rules are important to this present study because this study asks how teacher input affects the NNS student's access into the interactive event. This study also questions how teacher input affects the NNS student's speaking rights and responsibilities. Hence, this study asks about the role of NS teacher input in defining the NNS student's social role in in-group membership.

Summary of the importance of interaction

To summarize this discussion on the importance of interaction, it has been determined that participation in interaction:

1) allows the student the opportunity to share in the co-construction of knowledge,
2) provides the student the repeated practice needed to develop higher level academic communicative skills, and
3) determines the level of co-membership the student is to experience with the group.

Question concerning regularity of discourse conventions

In our discussion of the attainment of higher level academic communicative skills, an emphasis was put on the student's ability to recognize varying participant structures and their accompanying discourse conventions. If a student wishes to participate, s/he must master the use of these conventions. There is an assumption in this discussion, however, that needs questioning. The assumption is that in a given speech event, what marks the participant structure of the event is the regularity of the conventions used by given speakers. Speakers within a participant structure have defined roles and responsibilities. Within those roles, the speakers employ discourse conventions which determine when and how the various speakers participate. Even though natural variations occur among speakers and even within individual speakers, it is the regularity of those discourse conventions that marks a participant structure. It is the similarity that creates a context (Green & Harker, 1982).

What might happen, if the discourse conventions within a given participant structure were subtly modified for a particular portion of the speech community? If discourse modifications do exist in NS talk to NNSs, it is possible that such modifications might alter the regularity of the discourse conventions used by a teacher. If such modifications do exist in NS talk, how might this affect the non-native speaker's ability to identify discourse conventions which signal access to the speech event? Furthermore, if conventions varied for different groups of speakers within an speech event, how would NNSs know which conventions were to serve as appropriate models in the target language?

These are questions that drive this research project. To answer them we must first review what is known about native speaker modifications in the NS-NNS literature.

Chapter 3. REVIEW OF THE LITERATURE

Two bodies of literature play important roles in determining whether and how modifications in NS teacher talk affect the participation of LEP students: native speaker input to non-native speakers and classroom talk, specifically classroom talk involving non-native speakers.

Native speaker input to non-native speakers

The study of NS input has progressed from the early foreigner talk (FT) structural approaches begun by Ferguson (1975), through the functional studies of FT such as those by Long (1981, 1983) and by Freed (1980). Findings in the progression of the foreigner talk literature that are of particular importance to this study are: the recognition of the interactive nature of FT; the conclusion of the beneficial nature of FT; and the admission of the importance of the NNS's role in interaction to ensure comprehension, and hence, to ensure L2 acquisition (L2A).

Interactive nature of "foreigner talk"

Once it was determined that native speakers do indeed modify their input when talking with non-native speakers in a manner similar to the way caretakers alter their talk when talking to babies, the FT research expanded from simply describing the linguistic features of FT to exploring FT's role in interaction. Freed (1980) recognized that FT is not primarily ungrammatical and, although as syntactically complex as motherese or baby talk (BT), does exhibit significantly less syntactic complexities then native speaker talk to other native speakers (NT). If the syntactic composition of FT, the input for

L2 acquirers, is not dissimilar to that of BT, the input for L1 acquirers, then we must conclude that any difference in the development of L2A from that of L1A does not stem from the syntactic nature of the linguistic input. For this reason, Freed also looked at the interactive nature of the linguistic input in FT, specifically the relationships between utterances in a communicative context; that is, she attempted to describe categories of functional intent of utterances as distinguished from their surface forms. As a result of this work, she claimed that there is an important difference regarding the functional intent of BT from that of NT and FT. The function of FT and NT is primarily to convey information; the function of BT, comprised most often of action directives, is to elicit interaction. While Freed's categories and methods of assigning utterances to such categories are intuitive at best, with this study she moved the exploration of FT in a significant direction, from that of linguistic description to a description of its functional role in interaction.

Beneficial nature of foreigner talk

The second point within the literature of critical importance to this study is the claim that the interactive modifications found in FT are facilitative and necessary for second language acquisition (Arthur, Weiner, Culver, Lee & Thomas, 1980; Hatch, 1983; Long, 1981, 1983). In Long's (1981) review of the literature he credited FT with the following devices "presumably intended to facilitate comprehension and participation by the NNS" (p.263):

1) Topics are treated simply and briefly as compared to NT.
2) Topics will be dropped unexpectedly and shifted to accommodate miscommunications by the NNS.

3) Topics initiated in FT will be signaled by: additional stress, left-dislocation, intrasentential pauses, question forms as topic initiators, and frames ("ok, well").

Long further credited FT with the following techniques "to sustain conversation and to lighten other aspects of the NNS's interactional burden" (p.264):

1) NSs engage in cooperative dialogue supplying information to the NNS's utterances to help the latter express an idea.
2) NSs answer their own questions and ask rhetorical questions.
3) NSs frequently use an interrogative style, thereby requiring answers and, hence, sustaining the conversation.
4) NSs use many and frequent clarification devices to avoid conversational problems and to repair miscommunications.

In his own empirical study, Long found that 10 of the 11 interaction modifications measured occur significantly more frequently in FT than in NS-NS talk, specifically:

1) more present tense marking of verbs;
2) more questions in the distribution of questions, statements, and imperative;
3) more Wh questions in the distribution of question-types;
4) more confirmation checks;
5) more comprehension checks;
6) more clarification requests;
7) more self-repetitions;
8) more other-repetitions;

9) more expansions;

10) more of #4 through #9 combined (hereafter called "repair work").

Based on the findings of his own study, coupled with the claims made in the literature, Long determined that these FT modifications in interaction are necessary and facilitative to L2A; "current knowledge suggests they are found in all cases of the successful acquisition of a full version of a SL [second language]" (p. 275). While Long's arguments are convincing, he made no distinction between different aspects of L2A that may be differentially affected by these modifications. Furthermore, he did not account for the fact that these modifications are also present in cases of unsuccessful L2 acquisition; that is, these modifications are found in nearly all cases of NS interactions with beginning NNSs. Moreover, although such modifications may well be necessary for comprehension and hence facilitative in early stages of L2A, and although they may be intended to facilitate participation by the NNS, their full impact on participation by the NNS has not been satisfactorily analyzed. Verplaetse (1993) has found NS modifications to have patently detrimental effects on NNS participation in conversations, thus challenging the general premise that FT is primarily beneficial to NNSs. Verplaetse suggests that at some developmental point in the L2 learner's acquisition process, certain NS modifications become a hindrance to the NNS's opportunities for production. This point will be discussed in detail later in this section.

Importance of NNS's role in interaction

Another area of research within the NS input literature that is crucial to this study is the recognition of the importance of the NNS's role in interaction. Research by Scarcella & Higa (1982), Gass & Varonis (1985b),

Swain (1985), and Pica, Doughty, & Young (1986) and Pica (1988) echoed the importance of interaction in L2A, focusing on the negotiation of meaning, in particular, the NNS's role in this. These studies acknowledged that comprehensible input is necessary for L2A; but they claimed that it is the NNS's work in the negotiation of meaning that increases and/or ensures that the input is maximally comprehensible; thus the NNS's negotiation of meaning becomes crucial to the acquisition process.

In outline form, a history of the NS input literature reads:

a) Determination that FT exists;

b) Description of FT (its surface linguistic properties, primarily);

c) Recognition that FT can be described not only linguistically or structurally, but also, by its functional/interactive characteristics;

d) Claim that FT's modifications in interaction are necessary and facilitative to L2A; and

e) Recognition of the importance of the NNS's role in interaction in L2A.

Missing from this progression is an important step between d) and e), that is, determining whether native speaker modifications in interaction have any effect on the NNS's role in interaction. If the NNS's role in interaction is seen as important to L2A (point e), and if NS's interactive modifications are seen to be facilitative and necessary to L2A (point d), consider the dilemma facing NNSs if NS modifications were to impede the NNSs' role in interaction.

Detrimental nature of NS modifications

Verplaetse (1993) addressed this concern by looking at NS-NNS casual conversations in the workplace and found that NSs' modifications in politeness strategies (Brown & Levinson, 1978) and in the use of personal detail (Tannen, 1989) inhibited the NNSs' opportunities to interact. This is one of the few NS-NNS studies where the NS has remained constant; that is, comparisons were made of talk by NSs as they spoke first with another NS and then with a NNS in friendly, casual conversations (see also Derwing, 1989, 1991). While the modifications varied among NSs, the detrimental consequences were constant; that is, the NS modifications hindered the NNSs' roles in interaction by prohibiting co-construction of the text, by limiting speaker rights (Wilson, 1989), and by insufficiently ratifying the NNSs' positive face needs – the need to be ratified, understood, approved of, liked or admired (Brown & Levinson, 1978). Specifically, the NSs used strikingly less personal detail when responding to topics initiated by the NNSs. Another modification found was the reduction of supportive agreement statements (back channeling, extended responses, etc.) when responding to a NNS. In this study, although the NNSs indicated competence in conversational framework and knowledge of speaker rights, they were unable to participate in an equal manner. For without the NS's cooperation, the NNSs' co-construction of the conversation and the exercising of speaker rights were impossible.

While such NS modifications explicitly hinder the NNSs' role in the interaction, one must also wonder what the implications are for the NNSs regarding establishment of rapport, the ratification of their positive face

needs. While this affective concept of rapport is empirically difficult to identify and to analyze, there is no shortage of anecdotal evidence that NNSs are often treated "invisibly" or treated as "less than" their NS counterparts.

Another recent study supports the claim that modifications in native speaker input may be detrimental to the NNSs' conversational role. Shea (1993) claimed that at times NS attempts to assist NNSs in conversation construction through scaffolding strategies actually limit the NNSs' opportunities to maintain an authoritative role in shaping the text.

How can we determine whether these negative modifications are a feature of NS talk or simply a symptom of racism or other form of prejudice on the part of the few NSs observed in these studies? Furthermore, if such modifications are indeed part of NS talk, what causes such modifications to occur? In both of the above studies, the NSs observed were in casual, friendly conversation where speakers were peers in the speech event. In all cases the NS did not select silence over talk to the NNSs. In the Verplaetse study, the speakers were in dyads, so that talk had to occur. The NS modifications found were not born out of the NS's choice to avoid interaction with the NNS; rather the modifications were found in seemingly friendly ongoing conversation. Both the Verplaetse and the Shea studies have just begun to bring these questions to light, questions which will require further consideration in future NS-NNS studies.

The findings of Verplaetse and of Shea clearly contradict the generally accepted claim that NS modifications are beneficial to the NNSs' role in the communicative event. These findings suggest that while NS modifications may be of assistance to the NNSs during the early stages of L2 acquisition,

modifications occurring during more advanced stages of the L2 development may have a strikingly negative effect for NNSs in production.

A third study by Derwing (1989) also found detrimental qualities in NS modified input. In the NS's retelling of short film stories to NSs and to NNSs, some NSs increased the amount of background details when talking to NNSs to the point that it hindered NNSs comprehension. This study is important for two reasons. It is the first of recent studies (see also Chaudron, 1982; Hatch, 1983) to suggest a negative quality to NS modifications. Just as importantly, it is one of only two studies other than Verplaetse (1993) that looks at 'NS modifications in interaction' in a larger discourse perspective than the framework proposed by Long. That is, it identifies NS modifications other than the repair work strategies (confirmation checks, comprehension checks, clarification requests, self-repetitions, other-repetitions, and expansions).[1] The other of these two studies is Brown (1991), an analysis of NS-NNS interactions in which he proposes that certain interpretive tasks assigned by teachers will prompt language learners into using new language functions such as "hypothesizing". He then describes these new language functions as creating more "quality" output as compared to the traditional repair work, repetitions, prompts, and rephrasing functions that comes from less interpretive interactive tasks. These studies are creating a new framework for NS-NNS analysis; they suggest that the interactions and modifications go beyond the negotiated repair work that has been so thoroughly investigated.

[1] However, Derwing (1991) returns to the current, common trend to consider "conversational adjustments" by NS as only those repair work strategies outlined by Long (1981).

While the body of NS input literature cited above describes both beneficial and detrimental aspects of NS input to NNSs, all of the studies mentioned thus far have been focused on discourse genres other than classroom talk. Classroom discourse is made of patterns very different from natural conversation. In classroom talk, students are rarely the initiators of topics. Moreover, teachers' responses to students' utterances follow predictable functional sequences (i.e., evaluative responses, scaffolding questions, repair work with LEP students and with foreign language students, etc.). To translate the findings of NS modifications in NS-NNS conversations into expectations for classroom discourse one must ask how the NS teacher may modify talk in ways similar to the NS-NNS findings but in keeping with what is known about the talk of the classroom. For reviews of this literature, one needs to look at content classroom talk and, specifically, NS-NNS talk in the classroom.

Classroom talk

While the literature in classroom talk abounds, there are two areas of focus that are pertinent to this work: 1) the classification of categories for the variety of classroom discourses that exist to accompany the variety of tasks found in the content classroom; and 2) the role of interaction in the classroom event, with particular attention placed on the works describing the role of the NNS student.

Categories of classroom talk

Cazden (1988) summarizes how the classroom talk literature has identified a multitude of discourse events within the classroom setting, such as the writing conference, show and tell, recitation vs. discussion, exploratory

talk vs. final draft talk, science class talk, humanities-style class talk, foreign language classroom talk, etc. For researchers to be able to talk about these kinds of talk, an equally large number of taxonomies have been created. Such taxonomies have allowed us to paint an increasingly clearer picture of what classroom talk looks like. For example, teachers produce approximately 60% of all moves. Also, the primary teacher/student communication pattern is a 3 or 4-part sequence where the teacher structures the event and solicits a response, the student then responds, and the teacher reacts, usually in an evaluative function (Bellack, Kliebard, Hyman, & Smith, 1966; Mehan, 1978; Sinclair & Coulthard, 1975). The familiar code-name for this routine is IRE for "initiation, response, and evaluation" or IRF for "initiation, response, and follow-up". Beyond the basic IRF pattern there are also categories to distinguish among others: multiple cognitive levels of questioning (Bloom, 1956; Gall, 1970; Gallagher & Aschner, 1963) and types of questioning (Kearsley, 1976; Long & Sato, 1983) and functional types of turns in a classroom (Allwright, 1980; Flanders, 1970; van Lier, 1988).

While questions have been classified in a variety of ways, some of the categories of interest to this study follow. Classroom questions may be the type the answer to which is already known (display or evaluative questions) or they may be a genuine question the answer to which the questioner does not know (referential questions). Also, questions can be closed or specific requiring a minimal response or they may be open-ended or general requiring a more expansive response (Barnes, 1969; Bialystok, Frohlich, & Howard, 1978; Naiman, Frohlich, Stern, & Todesco, 1978). Furthermore, questions can be classified according to the level of cognitive function

required to answer the question, for example (listed in progression from lower to higher cognitive levels): recall questions to measure knowledge; analytic thinking questions to measure analysis; creative thinking questions to measure synthesis; and evaluative questions to measure evaluation (Bloom, 1956).

From the many descriptions of the functional types of turns in a classroom, one framework which helped shape the coding of this study is how a turn is allocated taken from Allwright (1980), to include: fading out, giving way to an interruption; making a turn available without making either a personal or general solicit; making a personal solicit; and making a general solicit (p. 169).

Another framework which helps to shape an understanding of this study's findings is Philips' (1983) categorization of differential ways in which a teacher ratifies a student's utterance, such as: direct ratification, pronoun substitution, ellipsis, expansion of the student's utterance, and repetition of part or all of the child's response and subsequently ways in which a teacher can fail to ratify a student's response: direct rejection of utterance, providing correct response, indicating non-incorporation of student's utterance by repeating their own previous utterance, and repeating their own previous utterance when there has been no student response. Unlike Philips' categorization, this study does not judge the teacher's direct rejection of a student's incorrect answer as an act that "fails to ratify" the student's response. Students will give incorrect answers. In particular participant structures it will be appropriate for a teacher to say "No, that's not correct". The accompanying teacher utterances determine whether or not such an act

ratifies the student's answer. Supportive comments, expanded explanations as to why it is incorrect, and well-developed reformulating-scaffolding can ratify the student's answer and the student, even though the student's answer may have been incorrect. It is the differential use of the strategies that accompany the direct rejection to an incorrect answer that has the power to ratify or fail to ratify.

For this study, the discourse event chosen for analysis is the classroom activity called teacher-led discussion and the particular focus is the teacher's role in this event. As was discussed earlier, such an event can comprise a variety of participant structures. In the teacher-fronted classroom discussions alone, varying participant structures were found in classroom observations for this study, including among others: 1) an inquiry, speculating event early in a topic's development in which one teacher (T) rarely used evaluative acts in response to students' utterances (even when the student's comments were incorrect!), but rather re-opened the floor to other students who had volunteered for a turn and allowed them to evaluate or initiate new comments; 2) a topic/homework review event, a quicker paced event during which the T would designate students (who had not volunteered to speak) to answer questions, followed by direct acceptance/rejection of the student's response with accompanying comments and evaluations.; and 3) a small group event during which the T moves about the room responding to groups or individuals who initiate an interaction by calling her name. What all these events have in common is that they are teacher-led. The teacher determines who gets the floor, who is attended to, and at what level and duration the attention continues.

Specifically, this project looks at teacher questions and responses. Even more specifically, it looks at whether questions are referential or display, whether they are open or closed, and what cognitive level of thinking the questions represent. With regards to teacher responses, this paper asks how much scaffolding is occurring, what is the cognitive level of that scaffolding, and how often, if ever, the teacher utilizes personal detail in response to a student's utterance.

Role of interaction in the classroom event

The second area of classroom talk literature pertinent to this study is the role of interaction in the classroom event, specifically: 1) the learner's need to be able to tacitly analyze ongoing interaction to gain entry into the classroom event, 2) the importance of student participation in the discourse as a determiner of the outcome of the learning event, and 3) the explication of the teacher's role in staging and ensuring this participation.

Chapter 2 of this paper has discussed in detail the first of these points. Learning to take part in the language activity of the classroom is like learning to play a game. One needs to know the rules; only upon the learning of these rules can the student play the game successfully (Bellack et al., 1966). In Mehan's (1978) discussion of turn-taking in the classroom, he described most succinctly the plight of the student in this game of classroom interaction, "Because the rules...are tacit, students must infer from contextually provided information the appropriate way to engage in classroom interaction" (p.49).

The literature described in Chapter 2 is important to this work in two ways. First, it underscores the dilemma facing each student, but particularly the NNS student; that is, that it is the responsibility of the student to surmise

from the contextual experience what the rules of classroom interaction are. Secondly, however, there is an underlying assumption that within a given participant structure, the teacher follows a set of discourse conventions indiscriminately, that the rules the teacher follows are the same throughout the classroom. What if that is not the case? What if the tacit interactional rules are altered when the teacher interacts with an LEP student? How can that student determine the appropriate rules for access into the speech event if s/he observes one set of rules for the majority in the classroom, and perhaps a second set for a minority few?

Chapter 2 of this study has also discussed the second point, the importance of interaction to the outcome of the learning event. While few claims are made regarding student participation and academic success, there is a strong belief that interaction provides the student the opportunity to co-construct meaning (Chaudron,1988) and even knowledge (Rosebery, et al., 1992; Wertsch & Toma, 1990) Given this belief, it is important to look at the opportunities provided the NNS student to co-construct meaning. In what ways are the opportunities similar and in what ways are they different from the opportunities to make meaning provided to the English proficient students? For this we turn to the literature describing point 3, the teacher's role in ensuring NNS participation in the classroom event both in the language classroom, and then specifically in the content classroom.

NS - NNS talk in the language classroom

Most of the NS-NNS classroom literature focuses on the foreign language classroom. This literature looks at the unique discourse role of the

foreign language teacher, how language becomes both the focus of content and the medium of communication. Long and Sato (1983) described this foreign language teacher talk as a hybrid of teacher talk (Cazden, 1979) and foreigner talk. Chaudron (1988) provided a summary of the modifications found as teachers talk to low-level NNSs in the foreign language classroom. These findings support the earlier findings of NS modifications in NS-NNS natural talk; they include: slower rate of speech, more pauses, exaggerated and simplified pronunciation, more basic vocabulary, lower degree of subordination, more declaratives and statements than questions, and more teacher self-repetition. Of critical importance to this body of work is the underlying acceptance that these modifications are beneficial to the learner: ". . .the adjustments in teacher speech to nonnative-speaking learners serve the temporary purpose of maintaining communication – clarifying information and eliciting learners' responses . . .the effects contribute to comprehension and learning. . ." (p.55). While this body of work leads to the conclusion NS modifications are beneficial to the L2 learner, still unresolved is how modifications might affect the learner in later stages of development.

The most interesting work that has come out of this body of literature is the movement towards the importance of student interaction, that the talk in the foreign language classroom must be meaningful, but must even go beyond meaningfulness and become communicative talk – talk that conveys the thoughts and ideas of the students themselves (Brock, 1986; Hatch, 1978). Pica et al. (1986) echoed the importance of interaction in their study of giving task directions to NNSs in two formats; first in a simplified FT version with no interaction allowed, secondly in a non-simplified version allowing NNS

interaction to negotiate meaning. The task performance level for those allowed to interact was superior. ·Interaction proved to be more important to NNS task production than input simplification.

While interaction through the negotiation of meaning is thought to enhance NNS task production, and such negotiating behavior has been identified in basic interpersonal communication, in language classrooms, and in experimental dyads, there is reason to question whether similar negotiating behavior occurs in advanced academic discussions. Musumeci's (1994) recent analysis of NS teacher talk to NNSs in Italian literature (content) classes (in an American university) found that both teacher and learners avoided extensive signalling of non-understanding and subsequent repair work in large class discussions. Non-understanding was signalled more frequently in small group work or one-on-one interactions.

NS-NNS talk in content classrooms

Only a few studies have looked at teacher talk to the NNS in the content classroom. Early (1985) confirmed that modifications similar to those found elsewhere in FT research were found in NS teacher talk to NNSs in the high school social studies classroom. Important in her findings is the increase in "conversational frames" when talking to a NNS, indicating more frequent changing of topics. In another recent study, Green (1992) described the persistent NS-NNS patterns of more polar and display questions when directed to NNSs, and the primary intent of teacher's questions to NNSs to be comprehension checks.

Slaughter and Bennett (1982) when looking at ways to elicit multiclause responses from young bilingual children determined that the

discourse style of the adult examiner strongly determined the complexity of the student responses. "In general, the quality of student discourse appears highly dependent upon the quality of the interaction between examiner and students" (p. 61).

Most importantly, Schinke-Llano's (1983) look at fifth and sixth grade teacher talk, as it differs between talk to LEP students versus talk to non-LEP students, showed quite clearly that the LEP students receive significantly less interaction than their non-LEP counterparts. Schinke-Llano counted numbers of interactions – "turns taken by speakers on the same topic" (p. 149), identified interactions as either directed to a single student or non-directed (spoken to the entire group), and coded interactions for their function, either as: instructional, managerial, disciplinary, or miscellaneous. She determined that 64 percent of all directed interactions to non-LEP students were instructional; that is, these interactions dealt directly with the course content. In contrast, only 39 percent of all directed interactions to LEP students were instructional. In fact, the majority of all LEP interactions were managerial; that is dealing with classroom management rather than course content. In her summary, "LEP students in content classes are interacted with less frequently than their non-LEP counterparts. When they are interacted with, the interaction is generally managerial in nature, rather than instructional. And even when the same functional type of interaction occurs, it is briefer" (p. 159).

It is not surprising to learn that the LEP students had less interaction. LEP students need silent time to process the content of the discourse. Furthermore, students from cultures other than middle-class American

culture come to the classroom experience with discourse styles which vary from the academic discourse style practiced in the classroom; this difference creates discordance and a lack of harmony in teacher/student interactions (Heath, 1983; Michaels, 1981; Philips, 1983; Scollon & Scollon, 1981). By calling less on the LEP students, the teacher may be responding sensitively to what s/he perceives to be the student's need for distance, or s/he may be responding unknowingly to a difference in response rhythms of the varying discourses of the teacher and LEP student. Furthermore, it is not surprising that the interactional content to the LEP students contained such a high level of managerial talk. Given the amount of repair work always found in NS-NNS talk, it would be expected that the teacher would have to repeat managerial instructions over and over in order to be fully understood. Naturally then, this would bolster the percentage of managerial turns in the teacher talk to the LEP students.

But what is crucial to these findings is that the teacher talk to the LEP students is again found to be briefer. It appears, as it did in Early's findings of more frequent topic changes, that the NS does not maintain the topic with the LEP interlocutor as substantially as that same NS does when interacting with a non-LEP interlocutor. Long (1981) has reasoned that the NS allows this brief treatment of topic to facilitate participation by the NNS. Verplaetse (1993) argued that such topic shifting restricted the NNSs' participation in the co-construction of text, thus reducing the NNSs' opportunities to interact fully and limiting the establishment of emotional rapport between interlocutors.

Furthermore, if instructional turns are significantly fewer in number for the LEP students, it is crucial that the cognitive level of those instructional opportunities be of a substantial nature equal to the opportunities of the non-LEP students. These are reasons why this paper proposes to look at the nature of teacher responses to see whether the scaffolding experience differs for the LEP student.

Finally, Schinke-Llano's work is important because it speaks to the issue of the student's self-esteem. It acknowledges that the teacher's input not only shapes the linguistic quality of the student responses; it also shapes the quality of the student's cognitive experience; and it may even shape the quality of the student's concept of self.

Chapter 4. RESEARCH METHODOLOGY

The methods used in this research consist of classroom observation, video and audio taping of class discussions, post-taping interviews of the teachers and selected students, and an analysis of the transcribed texts of the class discussions. This chapter outlines in detail each of the above steps. This chapter also includes a full description of the coding system and an outline of how the coding system is utilized to answer the research questions.

Data Collection

The data collected for this study includes 13 hours of transcribed classroom discussions, field notes from classroom observations, and the notes and tapes of interviews with teachers and selected students conducted during a screening of the videotapes.

Teacher Selection

Eight native English speaking science teachers (grades 6-12) from major New England metropolitan areas were observed and field notes were taken. From these eight, three teachers were selected to be part of the full study. This limited number was chosen for specific reasons. Although varying discourse styles are inevitable for each speaker, generalizable regularities do surface and can be discussed once similar observable behaviors are found in more than two subjects. While it is true that the more subjects analyzed, the more reliable the generalized observations become, due to the level of detailed analysis to be conducted, a large number of subjects would have been unreasonable. Moreover, the addition of only several more subjects would

enhance the generalizability of this study in no significant way (Delamont & Hamilton, 1976, p.13).

The criteria for class selection were as follows:

1) The class must contain LEP students who are identifiable by the teacher and by the researcher as "in transition". That is, they will still have marked accents and some indication that their abilities to exchange ideas in English are not yet fully "native-like". These students will have either recently transferred out of a bilingual program or they will be experiencing immersions in the L1 content classroom as part of their daily educational experience. There should be no fewer than 2-5 clearly identifiable LEP students per class. (This figure is determined from observations of 6 multilingual classrooms in inner-city schools during the spring of 1993 and from the viewing of videotapes of three other inner-city classrooms from another city during the same time period.)

2. The class grade must be between 6 and 12. Classes are to be monolingual, non-sheltered, science-based courses, defined by their discipline; i.e.: biology, earth science, general science. In these classes language is used as a tool to explore content. In contrast, in younger classrooms, language is often the content and the goal of the learning experience. Language is not to be the focus of the classroom talk, but rather a necessary tool for the classroom talk.

Of the three teachers chosen for this study, one is male and two are female; each white, and born in America into English speaking homes. Teacher A, the male, teaches in a suburban junior high that immediately borders the city limits. Both grades 7 (life science) and 8 (physical science)

were observed and taped. The LEP students identified by the teacher and the observer are 4 female Russian speaking students in each of the classes, 7th and 8th. These young ladies were in pull-out programs. All but two of them had been in the country and in the school ranging from 1-2 years.

Teacher B teaches science in a high school in a small, industrial city in New England. One classroom was observed, a non-college-preparatory science course with juniors and seniors who need the science unit to graduate. Three students are identified by the teacher as in language transition, all Southeast Asians. One male is Vietnamese who had previously been in bilingual programs for 2.5 years; the other male is Cambodian, who had been in mainstreamed English-only classes since his arrival six years previously; and the female's place of origin and language history remains undefined.

Teacher C also teaches in a suburban junior high school. This suburb, too, borderlines the city. One classroom was observed, a 7th grade life science course. The class is culturally mixed, approximately 50% of whom are Haitian. Three students are identified by the teacher as "LEP", that is, in language transition, one boy and two girls. They have been partially mainstreamed into science only in the last semester and are still attending the bilingual program much of the day.

All of the teachers observed came recommended (by their administrators or other researchers who had worked with them) as teachers who are particularly interactive in their teaching style and who exhibit an exceptionally caring approach to their LEP students; in other words, teachers who are ideal "models" of cross-cultural communication. It was the intent of

this research to select exceptionally caring and highly interactive teachers, so that the resulting data would not reflect a disinterest, an ethnic bias, or a more transmission-oriented instructional approach. By observing highly interactive and cross-culturally sensitive teachers, it is the project's hope to gather interaction samples that will allow us to explicate those strategies that do, indeed, assist LEP students in interaction. If, in fact, inhibiting modifications are found in the teacher talk of these model teachers, we can be assured that the modifications are unintentionally produced. Hence, merely by bringing such modifications to the conscious forefront, this work can inform the pedagogical field.

Science was chosen as the discipline for several reasons. One content discipline eliminates the problem of varying discourse styles according to varying disciplines. In addition, much has already been written about the language of science and in particular the language of science teachers; therefore, there is a strong literature base upon which to build this study. While Lemke (1990) suggested that the types of questions and interactions that go on in America's science classrooms are extremely limited, the selection of only highly interactive teachers has provided this study with a sufficiently rich data base.

After several visits to each classroom and collecting students' permission slips, classes were video and audio-taped. A video camera was used to gather a full-class view of the event. A separate microphone and tape recorder were placed on the teacher, so that any talk between teacher and student in any part of the classroom might be captured. Classes were videotaped until a minimum data collection of 100 utterances per teacher of

talk to LEP students were captured. In the case of Teacher A, 5 hours of class was taped with 213 utterances to the LEP students recorded. For Teacher B, 4 hours of class was taped with 165 utterances to LEP students recorded, and for Teacher C, 4 hours of class was taped with 337 utterances to LEP students recorded.

Interviews with the teachers were conducted before, during, and after the tapings. The purpose of the study was made known to the teachers beforehand. While this information most likely increased the number of utterances teachers produced to the LEP students, it is this researcher's belief that the knowledge in no other way biased the data. My reasoning is that the kinds of discourse conventions this project seeks to uncover are not part of a teacher's working agenda as s/he struggles to keep the attention of an entire class, develop a well-planned lesson, assess the progress of individual students, attend to students' questions, etc. On the other hand, the level of trust that is created by being up-front with the teachers initiates a collaboration and an opportunity for the co-construction of shared knowledge that is far more valuable than the chance of biased data. However, I did not share the specifics of my findings with the teachers during the taping process. I did not want to shape their behaviors by virtue of their own increased awareness.

Triangulation

Upon completion of the taping, transcriptions were made of the tapes. Selected portions were analyzed. At this point each teacher was interviewed to observe portions of the tapes, to confirm coding procedures on selected portions of the transcriptions, and to react in general to the findings.

Selected LEP students were also interviewed and allowed to view selected portions of the tape. The purpose of the student interviews was to get their reactions to the classroom events and to allow them the full opportunity to produce extended, high-level cognitive talk – to see just how much they could interact if given the opportunity.

This combination of multiple observer perspectives is an example of triangulation as defined by Denzin (1970) and a significant component of Mehan's (1978) constitutive ethnography. According to both, the greater the multiple methods, "the greater the confidence in the observed findings" (Denzin, p. 472).

Text Analysis

The transcribed texts were first reviewed to identify salient discourse convention patterns. Once particular conventions and language structures were identified, a final coding system was selected, modified, and applied to the texts.

But coding schemes and their consequential quantitative results can miss important points of analysis (Delamont, 1976). As counterpoint to this position, upon completion of the coding, a discourse analysis from a more macroscopic view was conducted. From this analysis, the findings from the coding process can begin to be explained.

It is important to note that the teacher talk comparisons made will be of one teacher as s/he talks to LEP students compared to how the same teacher talks to non-LEP students. There are no cross-teacher comparisons. Each teacher's style of talk establishes its own base-line for comparison. This

eliminates a weakness found in the majority of NS-NNS studies, where comparisons have been made of talk varying across subjects or speech events.

Coding System

The coding system used in this study is a modified version of the Sinclair and Coulthard (1975) system, a discourse analysis coding system designed for English speaking classrooms. A hierarchical description of the coding system is as follows: 1) The major transactional unit is identified. 2) Teacher talk that is related to the instructional content (as opposed to classroom management) is further categorized into Initiation, Response and Feedback moves. 3) These moves are again further categorized into functional acts. 4) Elicitation acts are then coded as to their cognitive level, whether the questions are open-ended or closed, and whether they are display or referential questions. 5) How transactional turns are allocated is also tallied.

Interlocutor specific transactions

The largest unit of analysis for this study is the transaction. According to Sinclair and Coulthard, the transaction is the discourse unit which comprises exchanges. Exchanges are either the three part Initiation-Response-Feedback (IRF) teaching exchange or a boundary exchange which serves to frame or focus the teaching exchanges. The boundaries of transactions or the means to determine how many transactions exist within the next hierarchical unit, the lesson, is less clearly defined by Sinclair and Coulthard than are the units of analysis lower in the hierarchy, specifically, the exchange, move, and

act. According to their model, a transaction can comprise exchanges among various interlocutors.[1]

Because this study compares how the teacher interacts with individual students, I have identified and described as the major unit of analysis the interlocutor specific (IS) transaction . The IS transaction is a string of exchanges between teacher (T) and a singularly specified interlocutor. Side exchanges (those not on topic) that interrupt the string will not serve as a boundary for the IS transaction if in the exchange subsequent to the aside the interaction between T and previously specified student continues.
For example, in the following exchange only the talk between T and Susan is considered; and only one IS transaction has occurred, even though the transaction is interrupted by Brian's aside:

T: .So how do we know how many babies will have yellow tongues and how many will have green ones?

Susan: You can figure it out by looking at the mom's and dad's tongues?

T: By looking at the parent's tongues. ((sees Brian's hand raised)) Brian

Brian: Do we have to be writing this down in our notebook?

T: You sure do.
So, Susan, how can we figure it out by looking at the parent's tongues? What does that show you.

S: You can see if their tongues are dominant or recessive. . .

[1] Mehan (1978) has addressed the need to further explicate the boundaries of the transaction. He has identified sets of 3-part interactional sequences as topically related sets . These are bounded by junctures at which point teachers and students can insert or redirect the talk. Junctures are signalled by kinesic, paralinguistic, and verbal behavior. Because more than one student can be involved in the interaction of a topically related set, this unit will not be purposeful to this study.

Should another student take the floor and produce an utterance on topic, the IS transaction is not necessarily considered ended if the topic is resumed with the original interlocutor in an uninterrupted fashion. If the T recognizes the interrupting utterance by responding to it, then that student's utterance and the teacher's follow-up move become an IS transaction of its own. For example, the following is still considered one IS transaction between T and Susan:

1)	T:	So how do we know how many babies will have yellow tongues and how many will have green ones?
	Susan:	You can figure it out by looking at the mom's and dad's tongues?
	T:	By looking at the parent's tongues.
side)	Brian:	Yeah, to see what color their tongues are.
	T:	So, Susan, how can we figure it out by looking at the parent's tongues? What does that show you.
	S:	You can see if their tongues are dominant or recessive. . .

On the other hand, if the teacher were to recognize Brian's utterance and respond to it then there would be a second IS transaction between T and Brian:

1)	T:	So how do we know how many babies will have yellow tongues and how many will have green ones? Susan.
	Susan:	You can figure it out by looking at the mom's and dad's tongues?
	T:	By looking at the parent's tongues.
2)	Brian:	Yeah, to see what color their tongues are.
	T:	To see the color of the parent's tongues. How can we figure it out by looking at the color of the parent's tongues? What does that show you, Brian?
	B:	The color will tell you if their tongues are dominant or recessive. . .

The specified interlocutor need not be originally identified by the teacher. When the T is speaking to the class as a whole, the IS transaction can include T general elicitations to the entire group (G), student's subsequent responses (if the student has not been directly nominated by the T), and the teacher's follow-up moves in reaction to the students' responses. Following is an example of such a series of general elicitation transactions.

1) T: So what is the father's genotype?

Susan: Hybrid.

T: Hybrid, correct.

2) And the mother's?

Bill: Pure dominant.

3) T: So what will be the genotype of the offspring?

Tom: 75% dominant, 25% recessive.

If in these general elicitations, numbers of students speak at once, such transactions will not be coded and analyzed for this study. Consider the following:

T: So what is the father's genotype?

Ss: Hybrid./ Dominant

T: I hear dominant and I hear hybrid. Which is it?

Ss DOMINANT/ NO, hybrid!

When, in such a general teacher-fronted discussion, a T nominates a particular student, allocating the floor to that specified student, a new IS transaction between that student and the T has been created. Furthermore, if during general elicitations to the entire group, a student self-selects and responds, and the T validates that student's role as specified interlocutor by

producing a follow-up elicitation to that particular student then the IS transaction of teacher to group has ended and a new IS transaction between T and this individually specified student has been created, the boundary being the teacher's initial elicitation which opened the floor to that student. Consider the following example in which Bill self-selects the floor during general elicitations, after which the teacher chooses to interact specifically with Bill:

1) T: So what is the father's genotype?

Susan: Hybrid.

T: Hybrid. Correct.

2) And the mother's?

Bill: Pure dominant.

T: So what will be the genotype of the offspring, Bill?

Bill: 75% dominant, 25% recessive.

Again, for this study, however, those transaction between teacher and general choral responses will not be coded. Only the transactions between T and identified, individual students or small groups of students will be coded and analyzed.

To summarize, an IS transaction is an interaction or a series of interactions between the teacher and one identified student interlocutor. The IS transaction can be interrupted by another student. The student's interruption is not considered a separate IS transaction unless the teacher validates the interruption with a response. If the teacher responds, then a separate and distinct IS transaction between the teacher and the interrupting student has been created.

Participant environment and participant structure of transactions

IS transactions are coded to describe the general participant environment of the speech event. Interactions occurring during teacher fronted classroom discussion to the entire group (whether the specified interlocutor is the whole group or an individual student within the group) will be coded "T-G"; interactions occurring during teacher-student conversations during small group activities will be coded "T-SG"; and interactions occurring strictly between one student and the teacher with no intention of others listening in will be coded "T-P".

In addition to this description of general participant environment, it is also necessary to identify the particular speech events and consequential participant structures. As was discussed in Chapter 2, a participant structure is "the conventional configuration of interactional rights and responsibilities that arise within particular activities" (O'Connor & Michaels, 1993, p. 320). It is clear from classroom observations that varying participant structures were employed for varying speech events. Because classroom discussions are found in a variety of participant structures and because varying participant structures contain varying discourse conventions, it is imperative for this study that the transactions under comparison originate from similar participant structures.

Turn allocations within transactions

Turn allocations, or how the teacher nominates students to respond to elicitations are coded as follows. This system is a modified version of Allwright's (1980) turn allocation system:

P T responds to an individual's bidding for turn, selecting one person in particular , or T continues a transaction with the student currently involved in the transaction.

P* T designates one person who has not requested the floor.

SG T solicits generally to a small group of students, who has bid for a turn or who currently is involved in a transaction.

SG* T designates a small group who has not requested the floor.

G T solicits to full class in general, opening up a bid for the floor; how that turn is then handed over is coded by whether the teacher selects from those bidding (nom), designates someone who has not requested the floor (G*), or allows a student to self-select (G>).

Transactions occur and turns are taken that are not initiated by a teacher elicitation. These are identified as follows:

> T gives way to interruption or allows student to self-select.

nom T gives the floor to a student at student's request.

T:in T initiates a transaction without an elicitation.

This study looks at how transactional turns are allotted; specifically, the frequency of turns designated to students who have not volunteered for the floor vs. turns granted to students who have volunteered for the floor. Designated turns include those marked with an asterisk (*); volunteer turns include P, SG, nom, and the self-select acts (denoted with the symbol ">").

Function: instructional content or classroom management

Schinke-Llano (1983) has shown that the majority of teacher talk to NNSs in content classrooms is on classroom management issues rather than

instructional content. Because this study is concerned primarily with the quality of interaction of content issues, those utterances determined to be about classroom management issues are not considered in the analysis. To this end all utterances are categorized as either instructional or management. Instructional utterances serve to request or convey information directly related to the content of the lesson, to include procedures relating to the lesson being conducted. Classroom management utterances serve to convey information concerning classroom procedures except for those directly related to the instructional content.

It should be noted that what constitutes instructional content and what constitutes classroom management varies from teacher to teacher. This will become apparent in the qualitative analysis of the three teachers.

Coding of moves and acts

Sinclair and Coulthard's system describes in detail the classes of moves in classroom talk that make up the teaching exchanges, framing exchanges, and focusing exchanges. Of the three, it is the teaching exchange that creates student participation, so it is this exchange that is analyzed in this study. In the classroom, teachers can initiate an interaction; they can respond to a student's question, and they can follow-up on a student's comment. These are the three fundamental teaching exchange elements: Initiation (I), Response (R), and Feedback or Follow-up (F). In the Sinclair and Coulthard system these elements are called moves.

For this study, a fourth elemental move is added. The primary unit of discourse in this study is the IS transaction, which can comprise a series of

interactional exchanges. Therefore, the nature of each follow-up move within an IS transaction is further categorized. Follow-up moves can initiate new topic information that can expand an interaction at a point where the interaction may also be considered completed. Consider the following text:

1 T: What is the genotype of the father, Bill?

2 B: Pure dominant.

3 T: Pure dominant, correct.
4 And the mother?

5 B: Homozygous recessive.

In Sinclair and Coulthard's system, lines 1-3 would be one exchange and lines 4-5 a second exchange. But for this study lines 1-5 comprise one IS transaction unit. In Sinclair and Coulthard's system, moves as in line 4 would be coded as an Initiation move (I) because a new exchange is initiated. But because this study is using the Initiation move only for the initiation of IS transaction units, a second coding for such Initiation/follow-up moves as in line 4 is defined as "scaffolding-initiation" and coded (S). This fourth type of move, the S move, initiates a new exchange, usually expanding on the earlier exchange. The earlier exchange could stand alone as if pedagogically complete, yet more topic information is pursued. Other types of scaffolding exchanges exist but will not constitute their own 'move' categories. They will be coded within the Follow-up move and the Response move and will be discussed in detail in the following pages.

In Sinclair and Coulthard's system, the three I, R, F elements are called moves. Moves are made up of acts. An act is similar in structure to an utterance or communication unit (Chaudron, 1988, p. 45), that is "an independent grammatical predication; the same as a T-unit," except that in

oral language elliptical structures also constitute such a unit or utterance. A move can contain a series of acts. For example, the following Initiation move contains two acts – first an evaluative act and then an elicitation act:

T: Jane, your answer to the last question was well thought out.
Go to the board and show us how to approach problem number 2, please.

More than one move can be contained in a turn as evidenced in the following example in the teacher's second turn, lines 3 and 4. Line 3 is a follow-up move; line 4 an Initiation move (or for this study, a Scaffolding-initiation move).

1 T: What is the genotype of the father, Bill?

2 B: Pure dominant.

3 T: Pure dominant, correct.
4 And the mother?

5 B: Recessive.

Following is a full description of the three moves (and this study's fourth move) and the acts that realize each of the moves. Figure 4.1 summarizes the coding system of these moves and acts. It is found at the end of this description section.

Initiation move

The function of the Initiation move (also, called opening move) is to create the opportunity for others to participate in the exchange. This move contains acts that signal attention to the topic, that elicit a response, that provide supplemental information, that check to see if participants are ready for discussion, that prompt and clue the student to respond, that open the floor to bidding, and that nominate the next speaker. This study is concerned with how the teacher composes the primary act of this Initiation move; that

is, how the teacher composes the proposition that causes another to participate. For this, the analysis focuses on what Sinclair and Coulthard call the "head" of the Initiation move, and from this head can be identified three Initiation acts: elicitation, check, and directive.

Elicitation: The elicitation (el) is "realized by (a) question. Its function is to request a linguistic response" (p.40). For this study the definition of elicitation also includes commands and statements whose illocutionary force indicates a request for a relatively immediate verbal response (oral or written) to be shared at that time with the questioner. Therefore such utterances as: "Which is the dominant trait?", "I wonder if you can tell me the dominant trait," "Debbie, tell us which is the dominant trait," and "Show us on the board how you determined which is the dominant trait," are all examples of an elicitation act.

Check: The check (ch) is "realized by a closed class of polar questions concerned with being 'finished' or 'ready', having 'problems' or 'difficulties', being able to 'see' or 'hear'. They are 'real' questions, in that for once the teacher doesn't know the answer. . . The function of checks is to enable the teacher to ascertain whether there are any problems preventing the successful progress of the lesson" (p.40). This study has expanded the notion of check to include polar comprehension checks and the polar pre-topic checks (Wilson, 1989, pp. 27-29), a questioning routine to determine if the targeted interlocutor is sharing the same understanding of topic. (For example, if the instructor is going to ask an LEP student a question about the process of measuring the mass of the styrofoam peanut, he may first hold up the peanut and say, "Sarina, did you measure the mass of your styrofoam peanut?" Upon her

positive response, he then proceeds to the real question of the interaction – how to measure the mass of the peanut.) Another example of such a check follows. In this example the teacher is seeking to determine if the LEP student can answer the next question by saying, "Can you do number 5 for us?" Only after the student signals that she is on topic, does the teacher continue with the actual interaction elicitation – to ask her to do problem number 5.

1 T: Lina, ((calling on an LEP student whose hand is not raised))
2 Can you do number five for us?

3 L: ((nods))

4 T: What is the answer to number 5?

Note how in the following example, the identical text, "Can you do number five for us," would be considered an elicitation, rather than a check:

T: ((looking about the room for someone new to call on))
1 Bill, can you do number five for us?

2 B: ((steps up to the board and draws the Punnet Square for number 5))
The offspring would all be hybrid.

Directive to action: The directive to action (d) "is realized by (an) imperative. Its function is to request a non-linguistic response" (p.41); that is, to elicit a non-verbal action. In this study directives to action may also be realized by interrogatives and declaratives. But the distinguishing feature of directives is that the response elicited is non-linguistic. "Close your books and take out a piece of paper" is a directive. In contrast, "Go to the board and draw a diagram of what you're saying" has a verbal/communicative element to it and therefore is coded as an elicitation rather than a directive.

Scaffolding-initiation move

As earlier mentioned this study's use of the concept of move significantly deviates from Sinclair and Coulthard's concept by the addition of a fourth teaching exchange move. In the Sinclair & Coulthard model once a teacher has initiated a question, the student has answered, and the teacher has responded to the student's reply, the exchange is marked as completed. If that teacher were then to expand the topic with that same student by issuing a new question, this question would be coded as the Initiation move of a new exchange. The Initiation move of the second exchange would not be differentiated from the Initiation move of the original exchange. While this study has no need to mark the boundaries of individual exchanges, it does need a way to identify teacher Initiation moves that are part of a scaffolding strategy within an IS transaction. Therefore this study needs a way to distinguish Initiation moves that initiate the transaction from Initiation moves that scaffold within a transaction. To this end, Initiation moves that are found at the beginning of an IS transaction (part of teacher's first or second turn, clearly initiating the teacher's transaction topic) will be coded I (as in line 1 of the following example). In contrast, Scaffolding-initiation moves that occur internally within the transaction, intended to further develop a current line of thinking, are coded S (as in line 4 of the following example).

1	T:	What is the genotype of the father, Bill?
2	B:	Pure dominant.
3	T:	Pure dominant, correct.
4		And the mother?
5	B:	Recessive.

Scaffolding acts that are part of a follow-up move will be discussed in the next section. One effective way to distinguish Scaffolding-initiation moves from follow-up moves is to ask the following question: Has the previous exchange been pedagogically satisfactorily completed; that is, can the immediately preceding exchange satisfactorily stand on its own? If the answer is "yes," then the next act is a Scaffolding-initiation act. It further builds on the topic; it challenges the student further; yet it remains within the same IS transactional unit. The same acts that make up the Initiation move also make up the Scaffolding-initiation move.

In summary, Initiation moves (I) and Scaffolding-initiation moves (S) are realized by acts which can be coded as elicitations (el), checks (ch), or directives to action (d).

Feedback move

The Feedback move (also called the follow-up move) is the third element of the 3-part IRF teaching exchange; its function is to react to the response, which was prompted by the original Initiation move. I am discussing this third move before discussing the second (the Response) because the Initiation and the Feedback moves are traditionally seen as the teacher moves, while the Response move is traditionally seen as the student move. I have both condensed and expanded Sinclair and Coulthard's description of acts comprised by the follow-up move to better fit the purpose of this study. Following is a list and definition of acts that make up the follow-up move:

accept (acc); Its function is to indicate that the teacher has heard the student's response, whether or not the teacher agrees with that

response. This act is realized by repetitions, paraphrases, back-channels, and one word comments like "Yeah" or "Fine".

evaluate (e); Its function is to comment on the quality of the response; such comments will reflect a judgement, an evaluation, on the respondent or on the response In this study, the evaluative act is realized either by explicit statements, such as "Good", or "Very interesting" or by strong tonal cues such as marked increase in pitch and volume (denoted in transcriptions by all caps.) Note: I have excluded repetition of student's utterance with questioning intonation from this category because this type of utterance is also used by the teacher to clue the student rather than to express evaluation. For example:

T: What is 2 plus 3, Billy?

B: Four.

T: Four?

B: No, I mean five.

I do not want to impose the level of inference needed to distinguish whether the T is evaluating or providing a further clue. In either case, a clue has been issued; therefore, this type of utterance is placed in the category containing clues.

comment (com); Its function is to "exemplify, expand, justify, (and) provide additional information" (p.42). Included in this category are teacher utterances that directly indicate if the student's answer is correct or incorrect ("yes/no"), teacher supplied answers to teacher issued questions, informatives that provide

clues, and rhetorical and tag questions that expand the topic or provide clues.

prompt (p); Its function is to "reinforce a directive or elicitation by suggesting that the teacher is no longer requesting a response but expecting or even demanding one" (p.41). This act is realized by a set of items such as "Go on," "Think," and "You have to figure that out."

There are three additional acts to be included in the Follow-up move, making use of the expanded notion of moves within an IS transactional unit in this study's attempt to describe various scaffolding strategies. This study identifies particular elicitations, checks, and directives – those acts that traditionally make up the Initiation move – as part of the Feedback move. Specifically, those initiatives that are in reaction to a student's incorrect or insufficient response are labelled as Feedback moves rather than Initiation moves or Scaffolding-initiation moves. Such follow-up acts indicate reformulating-scaffolding moves intended to redirect the student from his/her errant ways back on track towards a more correct line of thinking. Consider the following text:

1 T: What is the genotype of the offspring, Lara?

2 L: Recessive. ((incorrect answer))

3 T: Lara, what is the genotype of the father?

4 L: Hybrid ((incorrect answer))

5 T: Where is the father's genotype? On what part of the square?

6 L: The top?

7 T: Yes, the top.
8 And what two genes make up the pair on the top?

9 L: D and D

10 T: Yes. dominant and dominant.
11 So, what is the father's genotype?

In response to Lara's incorrect answer in lines 2 and 4, Teacher issues a series of questions (lines 5 , 8, 11) to bring the student correctly back to the earlier incorrectly answered question. The entire string of these redirecting elicitations will be coded under the Feedback move. Therefore, the following acts, coded "F: el", "F: d", and "F: ch" are also included in the Feedback move category:

elicitation (el); See definition above under Initiation

check (ch); See definition above under Initiation

directive (d); See definition above under Initiation

A final act to be included in the follow-up move also makes use of this study's expanded notion of the Feedback move. If, after a student's response, the teacher chooses not to follow-up, but rather to open up the follow-up move to the class in general, the teacher may produce a cue, its "sole function is to evoke an (appropriate) bid" (p.41). So, in the previous text, if in line 3 the teacher were to say, "I wonder if your classmates agree or disagree," this would be coded as a cue in the Feedback move. Therefore, also included in the Feedback move category is the act of cueing (cu).

In summary, the Feedback move or follow-up move (F) can be realized by the following acts: acceptance (acc), evaluative (e), comment (com), prompt (p), elicitation (el), check (ch), directive (d), and cue (cu).

Response move

While the second of the three part teaching exchange, the response to an elicitation, is primarily seen as a student move, there are times when the

student issues a question and the teacher needs to reply. At these times, the teacher's responses will be coded as R and designated by the following acts:

reply (rep); This act is realized by direct answers to the question, by the act of accepting (as defined above in the Feedback section), or by giving the student a clue to the answer.

prompt (p); See definition above under Feedback

Once again, referring to the expanded notion of moves, in an attempt to denote scaffolding strategies, this study categorizes teacher questions that are formulated as responses to student questions as acts within the Response. Consequently teacher moves coded "R: el" or "R: d" will indicate scaffolding moves intended to reverse the burden of inquiry; that is, the teacher will return the act of inquiry back to the student rather than supplying the student with an answer. An example of an R:el follows:

Student: I don't understand what we have to measure.

T: What do you need to know to compare the two masses?

An example of an R: d would be:

Student: I don't understand what we have to measure.

T: You need to talk it over with your group and come to a conclusion.

Therefore, also included in the Response move category are the following acts:

elicitation (el); See definition above under Initiation

check (ch); See definition above under Initiation

directive (d); See definition above under Initiation.

In summary, the Response move (R) can be realized by the following acts: reply (rep), prompt (p), elicitation (el), check (ch), and directive (d).

Summary of all four moves

Four teaching exchange moves are coded: Initiation (I); Scaffolding-initiation (S), Response (R); and Follow-up (F). Various acts within each of the four moves are also coded. Teacher elicitations are found in all four of the moves. In an Initiation move, teacher's elicitation initiates the IS transaction. In a Scaffolding-initiation move, the teacher's elicitation further challenges or further develops an existing transaction at an interactional point where the exchange could have been satisfactorily concluded. In a Follow-up move, the teacher's elicitation is in response to a student's incorrect or insufficient answer; its purpose is to remediate the student's answer. It is a scaffolding strategy called reformulation. Finally, in the Response move, the teacher's elicitation is in response to a student's question; it reverses the direction of inquiry back toward the student. It, too, is considered a scaffolding strategy.

Coding questions

Elicitation acts (found in all four moves, I, S, R, & F) are coded for their cognitive level, whether they are open-ended or closed, and whether or not the questioner knows the answer.

Cognitive levels

Based on Gall's (1970) compilation of cognitive categories, questions will be designated high level (H) or low level (L) according to the following breakout:

High: analytic thinking – reasoning, explaining, analyzing, making comparisons, supporting facts, drawing conclusions.

creative thinking – synthesis, planning, conjecture, speculating on outcomes.

evaluative thinking – evaluation, identifying main/important parts, stating judgements, evaluating adequacy of data.

Low: recall – memory, concrete knowledge, past experience, process recall, arranging facts in sequential order.

other – clarifying, comprehension, application, rules, describing situations, defining.

Samples of high cognitive questions include:

What would happen if you were to measure all ten of those at once? (speculation)
Why do you think the clay couldn't float in that shape? (conjecturing, synthesis)
Why is the tulip considered a complete flower? (explain)

Samples of low cognitive questions include:

Name two examples of complete flowers? (recall)
What are the main products of photosynthesis?(recall)
What are the steps to determine if that's igneous? (process recall)
Explain how you used the balance beam to measure the volume? (application)

Note that oftentimes it is the context of the situation that determines if a question is of high or low cognitive level. Consider the question, "Why is a tulip considered a complete flower?" If the explanation for why a tulip is considered a complete flower had been repeatedly covered in class, this question may be no more than a recall question – a low level question. If however, students had studied complete and incomplete flowers and were asked to consider the tulip and determine if it is complete, then the student must analyze the tulip, draw conclusions, and reason out his/her answer. This question in this context is a high level question.

Question types

Elicitations are coded for the length of response that is expected.

O – Questions eliciting an open-ended response are coded "O".

X – Questions eliciting a closed response are coded "X". These questions are usually yes/no questions or either/or questions (Barnes, 1969) or they can be clearly one-word response questions, of which the respondent's task is almost a fill-in-the-blank task. Example: "What color is this square?"

Elicitations are also coded for whether the answer is known or unknown by the questioner. This coding is a bit more elusive. The answer may be known by the teacher and yet the teacher may issue the question in a manner that suggests that the answer is unknown. Certain patterning of this type of questioning was found in particular participant structures. This is discussed in detail in the findings. For coding procedures the following directions were applied: code the elicitation as it is meant to be perceived by the hearer, that is, by its illocutionary force. Coding is as follows:

U – Referential questions, the answer to which is unknown.

K – Display questions, the answer to which is known (Long, M. & Sato, C, 1983).

Miscellany

Several other types of acts are coded in the speech. They are coded simply to account for their function; they are not counted in the analysis. These acts include:

asides (z) – individual statements or exchanges that are not meant to be part of the topical discussion on the floor.

loops (l) – clarification requests, its function is to return the discourse to the point before the previous speaker spoke, such as, "What?"

markers (m) – closed set of items such as "ok", "now", "so",; their function is to mark boundaries indicating that a new topic or a new exchange or a new transaction is about to begin.

starter (s) – a statement, question, or command, preceding the elicitation, that draws attention to a topic in order to make a correct response more likely. For this study, starters also include false starts to an initiation. False starts often include the above-mentioned pretopic orientation.

metastatements (ms) – a statement that focuses the ongoing discourse; it can either preview the topic that is about to begin or can function as a summary. This category collapses Sinclair and Coulthard's two categories – metastatement and conclusion.

Initiative comments (I:com) – comments made in conjunction with an initiating elicitation or directive to action, meant to focus the elicitation or directive or meant to offer clues.

Further miscellany rules for coding to ensure interrater reliability are found in Appendix B.

Coding System Summary

Teacher talk within Interlocutor Specified Transactions is analyzed. That talk which is determined to be instructionally related is further coded if its function serves to initiate, scaffold-initiate, respond, or follow-up.

Initiation moves (to include Scaffold-initiating), Responses, and Follow-up moves are further categorized by specific acts. Elicitation acts are further coded as to their cognitive level, whether the question is open-ended or closed, whether or not the answer to the question is known, and how the subsequent turn is allocated. This coding scheme is illustrated in Figure 4.1, p. 79. Figure 4.1 is duplicated in Appendix A.

Following is a sample of text illustrating how the coding system is applied:

Coding of a Feedback and subsequent Scaffolding-initiation move

1	F: acc	"Um-hmm.
2	F: acc	I see.
3	F: acc	So, the boat will float, but for just a while.
4	F: e	Interesting thinking.
5	S: el: HOUP	Why do you suppose that doesn't happen with a real boat, then?"

T has issued a Feedback move (F) in follow-up to a student's correct response. First the T accepts (acc) the S's utterance by issuing two back-channels (lines 1 and 2) and then by paraphrasing (line 3). T then evaluates (e) the student's previous reply (line 4).

This exchange could have ended at this point. But, instead the teacher wants to expand the exchange. In line 5, T challenges this student to think further by issuing another initiation in the form of an elicitation (S:el), a question that is of high cognitive level (H), open-ended (O), and referential (U) (the answer is unknown to T). The subsequent turn and floor are returned to the student who had previously held it (P).

	MOVE	ACT	QUESTION TYPES	TURN ALLOCATIONS
Initiation/			H O U	G, G*, G>
Scaffold-	I/S:	elicitation:	L X K	P, P*
Initiation				SG, SG*
	I/S:	check		
	I/S:	directive		
Response	R:	reply *(answers, accepts, clues, comments)*		
	R:	prompt		
			H O U	G, G*, G>
	R:	elicitation:	L X K	P, P*
				SG, SG*
	R:	check		
	R:	directive		
Feedback	F:	accept *(repetition, paraphrasing, back-channels)*		
	F:	evaluate *(explicit or exaggerated tonal)*		
	F:	comment *(answer, clue, rhetorical & tag questions, expand, inform)*		
	F:	prompt		
			H O U	G, G*, G>
	F:	elicitation:	L X K	P, P*
				SG, SG*
	F:	check		
	F:	directive		
	F:	cue		

Figure 4.1: Coding for Initiation, Response, Feedback Moves and Corresponding Acts
Also included: Coding for Questioning Types and How Turns are Allocated
Questions: Higher/Lower; Open/(X)Closed ; Unknown/Known
Turns: Whole Group, Small Group, Individual Person -
* = designated without volunteering; > = self-selecting

The following section will return to the research questions and explain how the coding system will be used to answer those questions.

Coding system and the research questions

Once the talk is coded, counts can be tallied to answer the research questions. Comparisons can be made to determine if differentiations occur between the teacher talk to LEP students and the teacher talk to EP students. An explanation of the counts follows.

Question 1. Do NS teachers interact with their EP and LEP students differently? Specifically, do teacher's discourse strategies which facilitate or inhibit a student's opportunities to talk as frequently and as purposefully as his/her classmates differ for EP and LEP students?

To be sure that the same types of teacher acts are eliciting the same types of responses, for both EP and LEP students, the length of student responses to teacher directives, checks, and elicitations was measured by assessing the mean number of words per turn. The resultant mean length of turn (MLT) was compared for EP and LEP students. This MLT indicates how much student participation each act elicits.

a. Empirically, are acts to initiate student participation differentially distributed? Also, are the content questions directed to LEP students of the same cognitive level as those directed to EP students?

Count: Proportion of total number of directives, checks, and elicitations to the total number of total I/S acts. The function of checks, an expected part of NS-NNS talk, is to repair misunderstood words, not to further promote a given topic in any purposeful manner. Consequently, this study focuses primarily on directives and elicitations.

Count: The number of directives in ratio to all directives and elicitations; and the number of elicitations in ratio to all directives and elicitations.

Count: Number of higher cognitive level and lower cognitive level Initiation (I) elicitations and of overall questions.

b. What are the percentage of open/closed questions asked to LEP students and to EP students?

Count: Number of open-ended and closed elicitations in all move categories (I,S,R,F).

c. Are turns allotted proportionately to EP and LEP students?

Count: Number of designated turns (P*, SG*, G*) compared to turns allotted to students who volunteered. Also, determined by observations and field notes of students' bidding attempts.

Question 2. Do NS teachers ratify the positive face needs of their EP and LEP students differently? Specifically, do a teacher's discourse strategies which function to indicate interest in students' thoughts, in their comments, and in the students, themselves differ for EP and LEP students?

a. Regarding quality of scaffolding, is there differential use in teacher reactions to students' responses - specifically the frequency of reactions and in the acts used to instantiate these reactions? Note: there are three types of scaffolding: i) scaffolding to redirect students' errant thoughts; ii) scaffolding to reverse direction of inquiry; and iii) scaffolding to further develop a correct thought.

Count:

i) to redirect - ratio of F:el's to all F acts.

ii) to reverse inquiry direction - ratio of R:el's to all R acts.

iii) to further develop thought - ratio of S:el's to all I/S acts.

To determine other differentiation in responses:

Count: ratio of F: acc; F: e; F: com; F: p; F: ch;
F: d; F: cu to all F acts.

Count: ratio of R: rep; R: ch; R: d to all R acts.

Is there differential treatment in the use of cognitive levels of teacher reactions?

Count: Number of high and low cognitive level F elicitations
Number of high and low cognitive level R elicitations
Number of high and low cognitive level S elicitations

b. Given that personal detail enhances rapport, how does the teacher use personal detail in the classroom?

Count: Observation of teacher's use or personal detail found in the transcripts will be tallied.

Furthermore, given that referential questions indicate interest in students' own personal ideas, is there differential use of referential and display questions?

Count: Number of known and unknown elicitations in all of the moves (I,S,R,F).

c. Does the teacher differentially use non-reaction or minimal reaction to a student's utterance as a discourse strategy? Empirically, what is the number of times a T does not respond to a student's question when the student has had the floor?

Count: Number of null-replies (R: 0) to student questions.

Question 3. If discourse strategies differ for EP and LEP students, why are such modifications occurring? Counts will not be used to answer Question 3. An analysis of the discourse is used for this purpose.

Analysis

An analysis of the frequency counts of the coded elements was then conducted using the chi-square test, an analysis of data with a between-

subjects design.[2] It should be noted that the frequencies analyzed in this study were proportions of acts as they are distributed rather than simple counts of the frequency of acts. In each observed classroom population sizes were quite different with typically seven times more EP students than LEP students. We would therefore expect frequency counts to be significantly higher in T-EP talk than in T-LEP talk. To account for this discrepancy, all statistical counts were computed by measuring the number of occurrences of an act as a proportion of a total group of acts issued to the same population. For example, a count of teacher Follow-up elicitations (F:el) to LEP students is analyzed in its proportion to the total number of Follow-up acts to LEP students. It is this ratio that is compared to its equivalent proportion in teacher talk to EP students.

A comparison of distribution proportions between two populations is meaningful only when the actual frequency counts of the two populations are relatively similar. Therefore, actual frequency counts are also considered; and when not relatively proportional, they are reported as such.

Inter-rater reliability was determined by training a second rater in the coding process, who then independently rated transcripts for two of the thirteen hours (15%) of the transcribed classtime. The transcripts chosen were from two different teachers. A total of 313 utterances were coded for move and act; and 101 elicitations were coded for three question types. Coding of the moves had an agreement rate of .98 and .99 for each of the two transcripts.

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[2] For analyses based on 2x2 contingency tables the Chi-square with a continuity correction is used. Readers should note that in cases where the expected frequencies are less than 5, type I errors are more likely to occur (Woods, Fletcher, Hughes, 1986). Consequently no claims of significance are made in cases: a) where an expected cell frequency is less than 1, or b) if more than 20% of the contingency table cells have an expected cell frequency of less than 5.

When adjusted for chance, using Cohen's kappa, these agreement rates are .95 and .97 respectively. Coding of the moves' subcategories (i.e., the acts) had an agreement rate of .98 and .96, and coding of the types of elicitations had an agreement rate of 1.00 for each of the transcripts.

Chapter 5. FINDINGS: Teacher A

Classroom observations

Teacher A teaches in a suburb of a major New England city. Because of the suburb's location, immediately adjacent to the city border and part of the metropolitan area's research hospital section, the suburb contains highly affluent sections alongside very poor neighborhoods. Consequently the middle school at which Teacher A teaches is a rich combination of socio-economic levels. The school district is well respected in this metropolitan area as a system where order is kept, programs are funded, and students succeed. The immigrant population represented in this district is primarily Russian speaking from all parts of the Soviet Union, although students from other countries are frequently represented – students whose parents may be working at a local hospital or university. Based on conversations with the teacher, it is safe to generalize that the Russian speaking students in his classes received strong academic support at home and faced high academic expectations from their families.

Teacher A's classroom is in the shape of a large L, with the teacher standing for the most part at the vertex of the angle. But the L is large enough that those students sitting in the back of one side of the classroom cannot see their counterparts on the other side of the L. The students sit at long chemistry benches, each containing a sink; this room was clearly once designed and used only as a laboratory. The room is filled with visual aids of all sorts plastered about the walls. A television, VCR, and CD-ROM are available at all times.

I observed both a seventh grade natural science class and an eighth grade physical science class with Teacher A. In each classroom there were four Russian immigrant students, all females. Of these eight Russian speaking students, six had been in the United States for about one year. They had daily periods of bilingual/ESL instruction from a bilingual speaking teacher. This teacher also attended some of their monolingual content classes and worked with the students while the monolingual class was being conducted. This arrangement occurred dependent upon the ESL teacher's schedule. The other two of the LEP students had been in the United States only two weeks. They spent a good deal of their class day in the ESL teacher's room, but were also expected to take part in the monolingual content classes as best as possible.

Teacher A is the kind of teacher that makes children want to become teachers. What was most striking about Teacher A's instructional style was the limited amount of management or disciplinary talk that went on in the class. This teacher had mastered the art of dialogic teaching. Almost all talk was content based and so much of the talk was initiated by students. Observation showed that his instructional style contained large amounts of class time engaging the students in inquiry - speculating about outcomes, wondering about why some phenomenon occurs as it does, such as why boats float, and more specifically, how the students might shape a glob of clay into a shape that would float, and why some shapes float and others do not. In small groups, students then conducted experiments to see whether their hypotheses were true. Teacher A would move about the room guiding students in their procedures. Full class follow-up discussion of results would

still be at the speculative/inquiry stage - with questions such as "What do you suppose that indicates?" Only then was information delivered to the students via very short lectures or referral to text books. During these phases of inquiry, it was noticeable how a student could express an incorrect thought, and no reformulating would occur by the teacher; rather he would open up the floor to other students who might reshape the previous student's thought or who might express an entirely new thought. The only evaluative statements expressed by Teacher A were judgements on a student's process of thinking, such as "That makes sense," rather than on the truth value of the content expressed. The more traditional IRE teacher-student interaction style was found in Teacher A's review sessions. Such review of topics came in the form of homework review at the board with teacher question and student answer format.

Another striking feature of Teacher A's classroom was the students' sophisticated use of scientific vocabulary in classroom discussions. Students readily used such terms as "hypothesis," "variables," "speculate," and "outcomes" in their natural discourse. Never did I observe Teacher A introducing a new word as a science word to learn; rather he simply used the words in natural, meaningful contexts and students "appropriated" them.

Teacher A's eighth grade physical science class included four of the Russian speaking students, two who had been here for a year and two who had been here for a few weeks only, but were already mainstreamed because of "their motivation." Teacher A reported that "they write everything down." He described the two who had been here a year as "successful students", earning good grades in his science class. The only concern he

expressed regarding their academic abilities was that they did not exhibit a willingness to apply their knowledge in creative ways. "They know a process and a method for finding volume or mass. But when I ask them to find both, they just do something familiar." However, he went on to admit "that is true for other students too." All four LEP students sat at one of the back tables and worked as a group during the experiment parts of class. In their small group work, they avidly discussed (in Russian) what was going on, and how to conduct the experiments. The two senior members freely argued about processes and results. The two newcomers watched and took part as best as possible.

All four LEP students in Teacher A's seventh grade natural science class had arrived sometime during the past school year; the most time any one of them had been in the States was one full year. Teacher A reported that two of these students were successful in their science class, as in other classes, according to the bilingual teacher. The other two were quite quiet and reserved. The bilingual teacher described them as struggling with issues of self-confidence and self-esteem. Neither teacher gave evidence of their academic ability. One of the two more successful students was strikingly assertive. Teacher A reported that even last year, her first year in the country, she asked questions in full class discussions. On my first visit, I happened to be standing near her and she freely interrupted me on several occasions for clarification on the class discussion; she appeared literally hungry to keep abreast of the action. She was the only LEP student of the three teachers' classrooms I observed who freely bid for the floor during whole class discussions. At the beginning of my observations, this group of LEP students

also sat together in the back and worked as a group. They were positioned in the back for a reason. Oftentimes during class, the ESL instructor would come into class and assist the girls. She would explain in Russian what the teacher was saying or doing in English. Sometimes this appeared to me to be a serious distraction for the girls. However, in discussions with Teacher A, he felt that the good that came out of the arrangement far outweighed the problems of distraction. By the end of my observations, at mid-semester point, the teacher had rearranged the seventh grade class's student seating and their small group study partners. The two more assertive LEP students were assigned to sit together and to work with two other EP girls. The two shy LEP students were similarly assigned. Teacher A explained to me that he felt it was time to get them more integrated; he felt that they were ready for such a move.

Analysis

Table 5.1 presents a distribution of the total acts which Teacher A used in his speech to EP and LEP students. They are distributed among the four moves: Initiation (I), Scaffolding-Initiation (S), Response (R), and Follow-up (F).

TOTAL	acts	I	S	R	F
EP (n=38)	508	56	38	57	357
LEP (n=8)	168	19	13	23	113

Table 5.1: Frequency of teacher acts in Initiation (I/S), Response (R), Follow-up (F) moves Teacher A.

A brief overview of results reveals that Teacher A used a similar distribution of I, S, R, and F acts for T-EP and T-LEP transactions. Also proportionate was the distribution of display and referential questioning. However, Teacher A exhibited significantly differential use of: 1) open-ended and closed questions, 2) cognitive levels of elicitations, and 3) elicitations and directives to action. Each of these modifications is discussed in detail as we look at the research questions one by one.

Opportunity to Speak

Question 1: Do NS teachers interact with their EP and LEP students differently? Specifically, do teacher's discourse strategies which facilitate or inhibit a student's opportunities to talk as frequently and as purposefully as his/her classmates differ for EP and LEP students?

Answers to this first question were determined by comparing between EP and LEP groups: 1) the distribution of Initiation acts, 2) the distribution of overall elicitations and directives to action, 3) the distribution of cognitive levels of Initiation elicitations and overall elicitations, 4) the distribution of open-ended and closed questions, and 5) the frequency of turns and methods of turn allocation.

First, the distribution of acts in Initiation (I/S) moves was analyzed to determine whether questions (elicitations) were evenly distributed. Table 5.2 shows that in Initiation moves, Teacher A used elicitations proportionately more often in speech to EP students than to LEP students ($\chi^2 = 19.19$,

p = .0001). In contrast, he tended to use directives and checks more often in his speech to LEP students than to EP students[1].

Teacher A Class	EP				LEP			
(class grade)	acts				acts			
class event	c	d	ch	el	c	d	ch	el
(7) T-G.1	1	0-	0	17	1	0	0	1
(7) T-G.2	0	3	1	18	0	0	0	4
(8) T-SG,lab	0	0	0	15	0	4	6	3
(8) T-G	1	0	0	12	1	0	2	5
(7) T-G.3	2	1	0	23	0	0	1	4
Total:	4	4	1	85	2	4	9	17

Table 5.2: Distribution of acts in Initiation (I/S) moves
acts: c = comments; d = directives; ch = checks; el = elicitations
class events: T-G = full group discussion; T-SG = small group work

Frequent checks are a natural part of NS-NNS talk; they include comprehension checks, confirmation checks and pre-topic check routines (Wilson, 1989, pp. 27-29), routines of questions and answers which the NS conducts to make sure the NNS knows what is being talked about. These check acts are to be expected as part of the framing and repair work accompanying NS-NNS talk. Such acts do not develop a topic; rather they provide an opportunity to clarify an utterance or to ensure that a proposed topic is understood. Given the function and expected frequency of checks in

[1] Due to low expected cell frequencies, significance cannot be determined.

NS-NNS talk, this study focuses primarily on acts other than checks[2], specifically, the distribution of elicitations and directives.

Before further consideration of the distribution of acts, the two primary Initiation acts, elicitations and directives, were compared to determine which produced the most frequent opportunities to speak. Students' mean length of turns in response to these acts were calculated. The typical response to directives to action was either a student action with no verbal response or a student action accompanied by a one-word response; hence the MLT in response to Teacher A's directives to action was .55 word for EP students and .35 word for LEP students. Elicitations, in contrast, almost always resulted in a verbal response. The MLT of students' responses to closed elicitations was 1.69 for EP students and 1.78 for LEP students; for both populations the range of responses was 1-5. The MLT of students' responses to open-ended elicitations was 9.85 for EP students (with a range of 1-43) and 4.38 for LEP students (with a range of 2-13). It is clear that Teacher A's elicitations created more opportunities for students to speak than did directives to action. Therefore, it is important to determine if the teacher used these two acts differentially.

Table 5.3 shows that in all four moves, Teacher A used proportionately more elicitations with EP students and more directives with LEP students ($\chi^2 = 11.97$, $p = .0005$). Given the population size for each group and the relative frequency counts the increase of elicitations to EP students is slight

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[2] To ensure that checks did not provide differential opportunities for speech, the mean length of responses to checks was computed before eliminating from the study. In response to a check a student would typically issue a one-word response such as "yes" or a word-repetition, or the student would often nod using not words; hence, the MLT in response to Teacher A's checks was less than 1 for both groups: .85 word for EP students and .57 word for LEP students.

(with a EP : LEP ratio of 3.4 : 2.8); however, the increase of directives to LEP students is more striking (with a EP : LEP ratio of 1 : 5).

Teacher A	EP (n=38)	LEP (n=8)	Rel. Frequency EP : LEP
directives	10	10	1 : 5
elicitations	131	23	3.4 : 2.8

Table 5.3: Differential distribution of directives (d) and elicitations (el) (found in all moves - I/S, R, F), and Comparison of relative frequencies

With regards to a student's opportunity to speak as purposefully as his/her classmates, the cognitive levels of Initiation elicitations were analyzed. Table 5.4 shows that approximately 50% of Teacher A's Initiation questions to EP students were of high cognitive levels, asking students to speculate, reason, analyze, or explain. In contrast, no high cognitive level Initiation questions were elicited from the LEP students.[3]

Considering the cognitive levels in the overall use of elicitations (in all four moves), however, Table 5.5 shows that higher cognitive questions were issued significantly more frequently to EP students than to LEP students (χ^2 = 23.35, p = .0001).

[3] While these numbers clearly indicate a differential use of question types, the zero frequencies in the T-LEP talk prevent a statistical claim regarding the relative occurrence of Initiation elicitations.

Teacher A	EP		LEP	
(grade) class event	H	L	H	L
(7) T-G.1	5	5	0	1
(7) T-G.2	7	10	0	2
(8) T-SG, lab	2	3	0	3
(8) T-G	4	0	0	2
(7) T-G.3	7	5	0	2
Totals:	25	23	0	10

Table 5.4: Higher (H) and lower (L) cognitive levels in Initiation (I) elicitations class events: T-G = full group discussion; T-SG = small group work

Teacher A	EP	LEP
High	76	3
Low	55	30

Table 5.5: Differential use of cognitive levels of all elicitations (found in all moves - I/S, R, F)

Also considered in measuring students' opportunities to speak is whether students have the chance to express extended thoughts; thus the distribution of open and closed questions. This study confirmed what earlier NNS classroom studies have shown; as Table 5.6 indicates, EP students received a greater portion of open-ended questions than did the LEP students ($\chi^2 = 11.24$, $p < .001$).

Teacher A	EP		LEP	
(grade) class event	O	X	O	X
(7) T-G.1	13	6	1	2
(7) T-G.2	17	8	1	3
(8) T-SG, lab	23	6	6	2
(8) T-G	11	1	2	5
(7) T-G.3	24	22	1	10
Total:	88	43	11	22

Table 5.6: Distribution of open (O) and closed (X) questions in all moves (I,S,R,F) class events: T-G = full group discussion; T-SG = small group work

However, the use of closed questions is often a useful instructional strategy. Certainly as part of a reformulating scaffold, a teacher might turn an open-ended question into a series of closed – "either/or", or "yes/no" – questions. Therefore, to eliminate the issue of appropriate scaffolding, the distribution of open-ended and closed questions was also analyzed just in Initiation-only moves, as shown in Table 5.7. While the ratio of open to closed questions in Initiation-only moves was approximately 2:1 for the EP students and 1:2 for the LEP students, the tendency does not reach significance ($\chi^2 = 2.78$, $p < .10$). This question remains open for future analysis.

In each interview with the LEP students, I asked higher cognitive, open-ended questions to determine their abilities to answer in understandable extended discourse. In my interviews with Teacher A's students, the two more vocal girls from each of the seventh and the eighth

Teacher A	EP		LEP	
(grade) class event	O	X	O	X
(7) T-G.1	6	4	1	0
(7) T-G.2	10	7	0	2
(8) T-SG, lab	4	1	2	1
(8) T-G	3	1	0	2
(7) T-G.3	8	4	0	2
Total:	31	17	3	7

Table 5.7: Distribution of open (O) and closed (X) questions for Initiation moves only class events: T-G = full group discussion; T-SG = small group work

grades answered such questions. Following is a section of one of the answers. Sarina, an eighth grade LEP student, attempted to explain to me why her clay boat was able to float. Her group had molded the piece of clay into the shape of a pillow. As she explained, the pillow needed to hold as much air (in volume) as the volume of the clay.

1	I:	Why do clay boats float? How does that work?
2	S:	Like, if you take the clay?
3		And you put it in a shape like a pillow?
4	I:	Yeah
5	S:	You need the same amount air inside, uh, like, uhm
6		You have, you need like
7		Well they take the clay, uhm in shape like circle?
8	I:	mm-hmm
9	S:	And we put in the water we find (----)of the water 25 milliliters.
10		And when we take the shape, the pillow?
11		And we put in the water, we find it was 25 milliliters bigger than it was.

12		So if we uhm, if we want the clay float on the top of the water, we need same amount of air inside=
13	A:	=as the clay
14	S:	Yeah, as the clay.

In line 5, Sarina struggled as she faced the need to explain that the amount of air inside the pillow needed to be equal in volume to that of the clay. Instead of attempting what would be a difficult embedded sentence, she restarted in lines 7 and 9 to describe how to determine the volume of the clay and successfully completed her original thought in lines 12 and 14. In line 13, Sarina's classmate, Aida, helped to finish the statement. This discussion continued at length. Diagrams were needed as an aid to this discussion; but I would point out that diagrams were also required by EP students during full class discussions on this topic. The accuracy of her answer is not as important as her ability to express her thought. According to Teacher A, it took him "years to fully understand the concepts behind water displacement. I'm more concerned with the scientific processes used to get the answer, than the answer itself." In this example we see that Sarina was using a scientific process and was able to discuss the process, although rudimentarily so, in extended English discourse. All four Russian speaking students whom I interviewed exhibited this ability.

The final focus in the analysis of students' opportunities to speak is on turns to be part of a transaction. With regards to frequency of overall transactions, 38 EP students participated in 95 transactions; 8 LEP students participated in 21 transactions. Hence, EP students and LEP students had equal opportunities to be part of transactions. To establish how turns were

allocated, the frequency count focused on Initiation-only acts, contrasting designated and volunteered turns. Designated turns were those in which the teacher called on the student without the student having volunteered. Volunteered turns were those in which students bid for the floor (for example: by raising hands, calling out, or self-selecting). In the transactions with EP students, Teacher A initiated 21 of the transactions by designating a student to take the turn, while 74 of the transactions were volunteered by EP students. In the transactions with LEP students, Teacher A initiated 10 of the transactions, and 11 were volunteered by students. These results ($\chi^2 = 4.488$, $p < .05$) mark a reverse trend to that expected. While the EP students volunteered more frequently, Teacher A designated LEP students to take part in transactions more often than he designated EP students. I am confident that this teacher's awareness of an observer watching his interaction with LEP students had some effect, and hence provides some of the reason for this phenomenon. On the other hand the sheer simplicity of calling on LEP students whether or not they have volunteered sheds light on how one might increase LEP interaction opportunities. I would point out further that this teacher was highly sensitive to how such "drafting into service" might impact on these students' self esteem; during our conversations together he reported his concerns about putting them in situations where they may become embarrassed. Two of the seventh grade LEP students discussed in the post-taping interview their mixed feelings about being called on. They wanted the teacher to ask them questions, but at the same time they were worried about giving an answer "in bad English." The bilingual teacher had already encouraged Teacher A to ask the LEP students more questions,

suggesting that frequent unsolicited nominations from the teacher was the style of instruction for these students when in the Soviet Union. When he did designate an LEP student, he would first use a check routine to determine if the student could answer the question. Once he was observed to whisper to an LEP student during a preceding interaction with another student, "Get ready, I'm going to call on you for Number 4."

A final comment about turn allotment that is not evident from the frequency count: for Teacher A, it was observed that every time an LEP student volunteered for the floor, this student was selected. This strategy certainly encourages participation, particularly for shy or culturally reticent LEP students.

To summarize the findings with regards to opportunities to speak, although the frequency of elicitations was relatively equal for both groups, the elicitations differed in type. Teacher A used more high cognitive questions and more open-ended questions with EP students than with LEP students. Directives, which elicit less participation, were issued more often to LEP students. On the other hand, turns were evenly distributed and Teacher A called on LEP students who had not volunteered more frequently than EP students who had not volunteered.

Positive Face Needs

Question 2: Do NS teachers ratify the positive face needs of their EP and LEP students differently? Specifically, do teacher's discourse strategies which function to indicate interest in students' thoughts, in their comments, and in the students, themselves differ for EP and LEP students?

A way to measure the teacher's expressed interest in the students' thoughts is to determine the quality and quantity of teacher responses to students' expressed ideas. Therefore, this study analyzed the frequency of elicitation acts in all three types of scaffolding moves (I/S, R, & F); the cognitive levels of these elicitation acts, and the distribution of acts in the Response moves and Follow-up moves. Another particular way a teacher indicates interest in a student's thoughts and in the student as a unique person with thoughts of his/her own is by asking real questions, the answers to which are unknown. Therefore, this study measured teacher's distribution of display and real, referential questions. Additionally, the use of personal detail by the teacher was measured.

The first analysis is of the frequency of scaffolding elicitations in their three distinct environments: i) in Follow-up moves, reformulating scaffolding, a follow-up question to a student error or to an insufficient student answer, ii) in Response moves, a question in response to a student's question, thus reversing the direction of inquiry, and iii) in Scaffold-initiating moves, a scaffolding question to further challenge a student or to further develop a student's correct line of thinking. Table 5.8 shows that Teacher A used all three scaffolding techniques proportionately among EP and LEP students. The only marked difference occurred in the class day marked "(8) T-SG lab" (Teacher - Small Group). During this lab, out of 15 Scaffolding-initiation acts to EP students, 10 were elicitations. In contrast, out of 13 initiation acts to LEP students, 0 were elicitations. The zero frequency in the T-LEP talk prevents a statistical claim regarding the relative distribution of

class & participant structures	moves	EP elicitations	EP total acts	LEP elicitations	LEP total acts
(7) T-G.1	F	2	90	1	16
inquiry	R	0	18	1	17
	S	7	18	0	2
(7) T-G.2	F	6	78	0	14
inquiry/	R	1	9	0	0
review	S	1	22	2	4
(8) T-SG	F	9	49	5	34
lab	R	5	26	0	1
	S	10	15	0	13
(8) T-G	F	0	46	2	24
inquiry	R	0	4	0	4
	S	8	13	3	8
(7) T-G.3	F	23	94	7	25
homework	R	0	0	0	1
review	S	11	26	2	5
Sub-totals:	F	40	357	15	113
	R	6	57	1	23
	S	37	94	7	32
Total:		83	508	23	168

Teacher A

Table 5.8: Frequency of scaffolding elicitation acts in relationship to total number of acts in each move

moves: F = follow-up; R = response; S = initiation-scaffolding

classes: (7)=7th grade; (8)=8th grade; T-G = teacher to full group; T-SG = teacher to small group

elicitations in the Scaffolding-initiation acts. However, the differential use is evident.

This differential use of scaffolding elicitations found only in the small group event suggests that the differential behavior is dependent upon the participant structure of the event. In this case, for Teacher A, the small group lab experience yielded a highly interactive environment for EP students, particularly in the opportunities to be further challenged; while the same opportunities were unavailable to the LEP students. Part of the reason for the absence of scaffolding questions to LEP students is that Teacher A spent much of his interactive time with LEP students clarifying to them what procedures needed to be done during the small group lab experience and did not have the time to also initiate challenging scaffolding questions. This issue of time pressures will be explored in detail in the discussion in Chapter 8.

What these results do show is that claims made about teacher talk to differentiated groups in a classroom must take into consideration the participant structure of the class. If analyses are done without making this distinction, there is a danger of losing the points of differentiation. Consider, for example, the two class events designated as "inquiry" events. In both cases, the ratio of Follow-up elicitations to total Follow-up acts is low for both EP and LEP students. In an inquiry event, Teacher A did not reshape students' errant thoughts; he simply accepted them and moved on to other students; hence, the low frequency of Follow-up elicitations. In contrast, consider the class designated as "homework review". In this participant structure, Teacher A frequently reformulated incorrect student responses. As a result, the proportionate use of Follow-up elicitations is quite high

Class	Move	EP		LEP	
		High	Low	High	Low
(7) T-G.1	F	2	0	0	1
inquiry	R	-	-	1	0
	S	5	2	-	-
(7) T-G.2	F	5	1	-	-
inquiry/	R	1	0	-	-
review	S	1	0	1	1
(8)T-G	F	5	4	0	5
lab	R	3	2	-	-
	S	7	3	-	-
(8) T-G	F	-	-	1	1
inquiry	R	-	-	-	-
	S	7	1	0	3
(7) T-G.3	F	9	14	0	7
homework	R	-	-	-	-
review	S	6	5	0	2
Sub-Totals:	F	21	19	1	14
	R	4	2	1	0
	S	26	11	1	6
Totals:		51	32	3	20

Teacher A Table 5.9: Cognitive Level of Elicitations in Each of the Scaffolding Moves (F,R,S)

(approximately 35% of all the F acts).

A second indicator of teacher interest in students' comments is provided by the cognitive levels of the scaffolding questions. Table 5.9 shows EP students received more high cognitive level scaffolding questions (χ^2 = 15.00, $p < .001$) when all three scaffolding moves are combined. Considering each move individually, more high level questions were addressed to EP students within Follow-up acts as well ($\chi^2 = 7.73$, $p < .01$); a similar trend also exists in the Scaffolding-initiation acts. It is reasonable to expect lower cognitive questioning in the Follow-up scaffolding move; after all the teacher is responding to a student error or insufficient answer and might therefore, naturally, break the previous question down into simpler concepts. However, Teacher A maintained the use of higher cognitive questions 50% of the time in his reformulating scaffolding (Follow-up acts) when interacting with the EP students.

The following three transcripts exemplify Teacher A's differential use of higher cognitive elicitations. The texts also demonstrate the greater use of elicitations with EP students and directives to action with LEP students. In these three transcripts we see Teacher A as he visits small groups of students who are busy comparing the density of a styrofoam peanut to the density of water. To calculate the density of each, students must first determine the mass and the volume of each. Volume is determined by measuring the water in a graduated cylinder, then adding the peanut to the water and measuring in milliliters the water displacement. Mass is determined for the peanut by weighing the styrofoam peanut on the triple-beam balance and for the water by weighing a graduated cylinder filled with water minus the weight of an

empty graduated cylinder on a triple-beam balance. In the first transaction, Teacher A talks with two EP boys who constitute a small working group.

1		((walks over to Jimmy and Allen, who are working together))
2	J or A:	We got the weight of one of the styrofoam.
3	T:	You got the weight of wo-,
4		how did you do that?
5	A:	((giggling)) we looked very closely
6	T:	So, are you questioning how accurate that is?
7	J:	No
8	A:	Cause it was right on like, we had it directly as zero. Then when we put it on it moved like the tiniest thing. then we got it to zero again.
9	T:	What do you think would happen if you put maybe ten of those on?
10	A:	It would be way more, like maybe 30=
11	T:	=Could you find the mass of one if you put on ten? ((Allen walks off to get more popcorn pieces.))
12	J:	They're not all the same.
13	T:	They're not all the same.
14		Yeah.
15		Let's see if that changes your number.
16		That's a good point Jimmy,
17		I don't know. ((T goes off to other groups.))

In this transaction Teacher A challenges Jimmy and Allen to consider whether their technique for measuring the styrofoam popcorn is an accurate method. Jimmy initiates the discussion, so T has no need to issue an initiating elicitation, but in line 4 does initiate further interaction by asking them to explain how they got the weight of one styrofoam. The teacher's next utterance in line 6 is to follow up the boy's insufficient explanation with

another challenging question. Allen's answer in line 8 is a sufficient one (as will be seen in the next two transactions, for indeed, that is how T suggests to the next two groups that they measure the weight of their popcorn pieces). Yet T challenges the boys again with two more high cognitive level speculative questions - lines 9 and 11.

The next transcript comes from the same event. T approaches a group of EP girls to assess their progress.

1	T:	What did you get for the mass of the styrofoam?
2	Mar:	Mass? point 202
3	T:	Can you show me that?
4	M:	Did it in the water.
5	T:	You did it in the water?
6		Can we find the mass of the styrofoam just by placing it on the graduated cylinder? ((T means triple-beam balance, not graduated cylinder))
7	M:	No, we can't,
-----	---	((side conversation amongst the girls about the topic they were on before T came up to them, the weighing of the water in the cylinder))
8	T:	Why can't you just put this on here ((putting popcorn on balance)) to find its mass?
9	M:	Cause it won't go up and down ((as she puts cylinder on balance))
10	T:	and it will go up and down if this is on here? ((referring to cylinder))
11	M:	((shakes head yes))
12	T:	((purses lips as if to say "Oh")) Fascinating ((walks off))

In this transaction, T initiates the conversation by asking them for one of the measurements - line 1. This is a very typical way for T to initiate

transactions with students as he moves from group to group; he asks them a question about what they have discovered. His immediate response to Marielle's answer is to challenge her to show him, to explain how she arrived at her measurement. M provides a less than satisfactory explanation and T, wanting to get her back on the correct track, responds with a reformulating question in line 6. This is a lower cognitive level question demanding that she recall a process already learned. In line 8, T focuses the girls back onto his topic after a 10 turn side exchange among the girls about weighing the water. But when M responds incorrectly again in line 9, T follows-up in line 10 with a higher cognitive level comparison question. Interestingly, he cannot convince the girls of the error of their ways. So he issues an evaluative comment, "Fascinating," and moves on to another group. During my interviews with Teacher A, he stated that the girls knew at that point by his comment that they were mistaken.

An interaction on the same topic occurred between Teacher A and the LEP students.

		((to LEPS, looking at Sarina's journal; reading her journal:))
1	T:	"mass of the graduated cylinder, mass of . . ."
2	S:	the styrofoam
3	T:	"styrofoam (----) ((pointing to her data chart))
4		That's the water?
5	S:	((shakes head yes))
6	T:	(2) What's this? ((pointing to data chart))
7	S:	(------)
8	T:	(3) Water and styrofoam ((checking with her))
9	S:	Yes

10	T:	So the volume of the styrofoam is 5 milliliters,
11		so now you have to find out- (2);
12		why don't you just put the styrofoam on the graduated cylinder, on-on the triple beam balance?
13		Can't you find the mass of this ((holding the popcorn)) just by going like that? ((putting popcorn on balance)).
14	S:	Yeah
15	T:	All right,
16		cause you found the volume of it ((pointing to her chart)).
17		So you could just do mass of styrofoam.
18	S	OK. ((Sarina rubs her head with confusion or question))
19		Don't we have to do this three time=
20	T:	=Oh, I see, wait, uhm (5)
21		((looking at chart)) you also have to find the mass of this water.
22		(4) If you do 80 milliliters of water, find out how much that, the mass of 80 milliliters of water is.
23		So you if you find this empty, ((referring to the cylinder, pointing to data in her chart)) then you can find the mass of this ((referring to the mass of the water)).
24		Am I confusing you?
25	S:	No
26	T:	No,
27		you know. (1)
28		Okay.
29		But, if you're going to find the mass of this ((points to the popcorn)) dry it off with a paper towel. ((walks away))

Teacher A has initiated this interaction by approaching the LEP students and reading their journal account of the work they are currently undertaking. This is the manner in which T typically approached these LEP students. In contrast, when approaching EP students who were not initiating the conversation, he asked the students to tell them what information they had derived thus far. So lines 1-10 are a pre-topic check which determines for T that the students have measured the volume of the styrofoam and the volume of the water. The teacher's attempt in line 12 is to get them to

measure the mass of the popcorn. Sarina agrees with his suggested procedure, but has a question of her own and exhibits considerable confusion. To her question in line 19, T gives no reaction; he is, instead still seeking to fully understand her chart. When I asked T later about Sarina's question, he said that the "three-time" process was the habitual way of measuring in the lab – "to always measure three times." He seemed to disregard it as unimportant given the tasks at hand. The next three lines, 21-23, are revealing, in that they are the typical way in which Teacher A interacted with the LEP students. He issued directives for the procedures they needed to do. This is in direct contrast to how he repeatedly conveyed the same propositions to the EP students - by issuing elicitations.

When I pointed this out to Teacher A, he had two reactions. First, he commented on how much more he had to focus on procedural issues with the LEP students – just to talk about <u>what</u> to do. This need to repeat procedural items with LEP students was a concern for all three teachers and is a clear indicator that the LEP students in the observed classes had difficulty understanding directions as they were presented. Additional framing by the teachers might alleviate some of this confusion; framing will be discussed in Chapter 8. It is important to recognize, nevertheless, that Teacher A's LEP students' L2 listening abilities were too limited to follow procedural concepts with the amount of framing and teacher direction sufficient for the EP students.

The second reaction was that he recognized the use of directives rather than questions. He began to list questions he would have used with the other students, such as: "So, what are you going to find next?", or "If you know the

volume of the styrofoam, what else do you need to find to determine its density?", and "How can you do that?"

Returning to the text it is noteworthy that after eliciting this series of directives, the teacher, himself, seems to sense that there is more confusion than clarity. He explicitly asks in line 24, "Am I confusing you." One of the most memorable discussions I had with Teacher A was his explaining to me that his major concern with the LEP students was that he did not know how to measure what they understood during discussions. He said that it was easy to assess the other students – whether they were understanding. I asked him how he assessed the other students' understanding. His answer: "I ask them." Curiously, I have no data indicating that he ever explicitly asked EP students if they understood. Rather, he measured their understanding by asking them questions about the topic, about the procedure; and their level of response indicated their level of current understanding. Teacher A tended not to use this same technique with the LEP students. Rather, he would tell them what to do next by issuing directives. In this case, he explicitly asked them if they were confused. It is fairly certain by Sarina's strong body language indicating confusion and by Teacher A's responses in lines 26-28, that the teacher knows that they're less than clear when he walks away to another group.

The third way of measuring a teacher's expressed interest in the students' thoughts was to analyze the distribution of acts other than elicitations found in teacher's Follow-up moves and Response moves. As Tables 5.10 and 5.11 show, no differences were found. Since the LEP students did not ask Teacher A many questions there are too few R moves to analyze.

Teacher A	EP	LEP
F: accept	133	42
F: evaluate	6	5
F: comment	147	35
F: prompt	7	1
F: check	13	8
F: directive	6	6
F: cue	5	1
F: elicitation	40	15
Totals	357	113

Table 5.10: Differentiation in use of Follow-up acts

Teacher A	EP	LEP
R: reply	49	19
R: prompt	1	-
R: check	-	2
R: directive	-	-
R: 0	1	1
R: elicitation	6	1
Totals	57	23

Table 5.11: Differentiation in use of Response acts

Regarding Follow-up acts, though nonsignificant, there was a trend for Teacher A to use more commenting (F:com) acts to EP students than to LEP students, and more evaluative responses and more directives to action with the LEP students. But further research is necessary to confirm these trends.

Another way a teacher can indicate interest in the students' thoughts and in the students themselves is by asking questions of the students, the answers to which s/he does not know. Teacher A was a master at the use of

referential (answer-unknown) questions. He described his role during the inquiry events as the one in the class who "wonders" out loud. This teacher was so adept at wondering with the students as opposed to questioning the students, that twice during the tapings students explicitly asked him, "Do you know the answer?" As Table 5.12 shows, referential and display questions were used in equal proportions to EP and LEP students.

Teacher A	EP		LEP	
(class) class event	unknown	known	unknown	known
(7) T-G.1	5	14	1	2
(7) T-G.2	8	17	0	4
(8) T-SG, lab	20	9	4	4
(8) T-G	9	3	6	1
(7) T-G.3	2	44	0	11
Total:	44	87	11	22

Table 5.12: Use of referential (unknown) and display (known) questions

As discussed earlier, use of personal detail is another way to indicate interest in another interlocutor. This study asks if the use of personal detail, either the teacher sharing his/her own detail or attending to the personal detail of students, is used differentially. No evidence of the use of personal detail was found in the transcriptions of Teacher A.

Finally, this study asks if teachers differentially use non-reaction or minimal reaction to a student's question. This was measured by the number of times the teacher did not respond to a student's question when the student

had the floor. For Teacher A, only one such action was coded for each student group, EP and LEP.

Completing LEP students' utterances

The final transaction reveals a phenomenon that could not be uncovered by the coding system. This was a very rare transaction in that one of the LEP students had volunteered to answer a question during a full-class discussion, a discussion about X and Y chromosomes and how it is determined that a zygote becomes a boy or a girl. Much speculation had gone on during that class hour. During the inquiry, T stopped twice to issue small lectures providing the correct information about how sex cells have just one chromosome and that a sperm has either the X or Y chromosome and the egg always has just the X chromosome. During the inquiry phase the participant structure included minimal teacher reaction, other than to accept by back-channeling or paraphrasing, then cueing another student to take the floor either to evaluate the previous student's answer or to initiate his/her own thoughts. After a brief lecture and as the end of class approached, the teacher changed the participant structure to that of a review event, a faster paced, rhythmic speech event including elicitations to designated students who had not volunteered to answer followed by acceptance of answer and moving quickly on to another student. For example, as one EP student gave an insufficient answer, T accepted by paraphrasing and promptly elicited the rest of the answer to his question from another designated student. Given this structure and pace, one of the LEP students had just issued an incorrect answer, answering "Yes" to The teacher's question, "Is this true, that eggs can

have Xs and Ys?" Several students attempted to self-select by saying "No" and "You said it's only X". Another LEP student volunteered to follow-up by raising her hand and T gave her the floor.

1	D:	Just an X and X.
2	T:	Just an X and an X
3	D:	Yes
4	T:	Why?
5	D:	Because the egg can just, the female. . .
6	T:	Females don't have Ys?
7	D:	No
8	T:	Because the Y makes it a male, right?
9	D:	Yes

This text serves as a wonderful example of what to do to elicit LEP student interaction and what not to do. Line 4 is a ideal model of how to further challenge a student with a scaffolding higher level cognitive question. Teacher A had used this technique only 7 times (out of 32 I/S acts) in his interactions with LEP students, while doing so 37 times (out of 94) in his interactions with EP students. Therefore for T to provide this chance for the LEP student to interact at this higher cognitive level was an important opportunity. However in lines 6 and 8 the teacher unwittingly sabotaged his own good intentions by supplying the answers for the student. This LEP student confirmed her ability to answer the question by discussing at length the details of the sex chromosomes during our post-taping interview.

Teacher A was shocked as he viewed this section of the videotape. He had no idea at the time that he was "feeding her all the answers" (his words).

Hatch calls this finishing of LEP utterances a "benevolent conspiracy" (Hatch, 1992, p.67). This will be discussed in Chapter 8.

To summarize the findings with regards to students' positive face needs, the frequency of Teacher A's overall elicitations in response to students' answers was nondifferentiated. Only in the lab event was a difference found; there he issued the challenging type of Scaffolding-initiation elicitations more frequently to EP students than to LEP students. Teacher A did issue significantly more high cognitive level elicitations in the scaffolding moves to EP students than in those to LEP students. There was also a trend for Teacher A to issue more comments to EP students and more directives and evaluative responses to LEP students in his Follow-up moves. Display and referential questioning was nondifferentiated. Use of personal detail and non-reaction to students' questions were used infrequently for both populations.

Chapter 6. FINDINGS: Teacher B

Classroom observations

Teacher B teaches high school science in a small industrial New England city an hour outside the state's capitol city. This high school is unusual in its design in that it houses both the vocational technical school and the traditional high school programs. This teacher teaches an "Integrated Science" class; that is, a course that combines all the disciplines of science around topics of interest. The course is level 2, below the standard required to be considered a college preparatory class. Curiously, when I first visited the school and met with the science department, I was told that this was the only science teacher who had a number of LEP students in her classroom. Knowing the demographics of the city, I was struck with the wonder of where the immigrant students were. Why were they not in college preparatory science classrooms? This was the second industrial, multicultural city in which I had received similar messages, that the college preparatory science classrooms contained few, if any, LEP students. When I asked the faculty of each of these two schools how it could be that they had so few LEP students in the college preparatory science classes, their response was that the bilingual programs must be doing a great job of helping the students to become English proficient. In other words, although they knew that immigrant students were a part of their school community, they assumed that these LEP students must be developing their language skills so well in the bilingual programs that at the high school level, all these same bilingual students were excellent speakers of English and indistinguishable from their native English speaking

classmates. The possibility that the LEP students had either dropped out of school or were tracked in non-college preparatory classes was not considered.

Teacher B's "Integrated Science" classroom contained 17 students, 3 of whom were LEP students from southeast Asia. Most of the students in the class, including one of the LEP students, were enrolled in the vocational high school curriculum. They were taking a science course as a requirement to graduate. Most were juniors or seniors finishing up course requirements. According to the teacher, they viewed the class as a necessary evil, something they had to get through, but they saw little importance to the course or its content. The students were extremely sociable and wanted to have a good time. They reminded me of the "Sweathogs" in the 1970's television series, "Welcome Back, Kotter." Some liked to playfully engage Teacher B in social prattle; others chose to use the time to take a nap or to read automotive magazines; and one student in particular was emotionally troublesome and demanding of everyone's attention. In spite of these challenges, Teacher B succeeded in covering considerable science content and in requiring reasonable class behaviors. She pointed out to me that it took over half the year just to get the class to operate as a class.

From Teacher B's own perspective, this class was unreasonably rowdy (although this observer had seen considerably rowdier classes in the past two years of observations). For example, the teacher reported that in the fall when they were studying Mt. St. Helen's volcanic eruptions, her other classes were allowed to study this topic by preparing for mock press conferences. Certain classmates were assigned as TV reporters, others as scientists, etc, and the class assignment was to research the issue and conduct TV interviews. This class,

however, was so disruptive, that she had to rescind the experiential learning assignment, and to revert to more traditional methods of lecturing, reading, and quizzes. She had been discouraged by their behavior, yet she also knew how to draw the lines in order to maintain stability in the classroom.

One of the reasons Teacher B is so successful with the non-college prep students is because of her combined no-nonsense approach coupled with an ability to appreciate the students for who they are and to project herself as a "genuine person with feelings, with good and bad days, like the students." Her expressed goals with these students were 1) "to get them [behaviorally] so that I can teach a class to them;" 2) to impart to them appreciation for their ownership of the planet; and 3) to help them appreciate what they have, to gain some knowledge for how it all works, to help them prepare to be informed users and consumers.

Teacher B expressed to me how she valued an interactive classroom, preferring it to the lecture format. Some days, she admitted, she had to revert to other ways of covering the material; that the content demanded such. But regarding interaction and its impact on learning, she believed that although it may "scare some kids" it is nevertheless "good for them".

The classroom, itself, was a traditional room with lines of desk-chairs, a room that was shared with other instructors. Displayed on the walls however were topical posters which had been created by her "Integrated Science" students. Immediately outside this classroom was a large laboratory area available to the class at any time. Consequently, lab-like experiences were not limited to the double period days; the facilities were always readily at hand.

As I have already mentioned the three LEP students in this class were all from Southeast Asia, but that is the end of their similarities. The least is known about Cui, the female in the class. It appears that this is the first year that she is in content classes. Her country of origin in unknown to Teacher B as is the number of years she has been in the country, and I did not have the opportunity to interview her myself. She is a single mother with considerable out-of-school challenges. Teacher B expressed to me more than once that she believes that Cui has other learning disabilities other than her second language issues. In fact, knowing that Cui is simply doing what is necessary to get the diploma, Teacher B was struggling with the issue of whether or not to fail her, based on real grades earned, or to pass her given her circumstances and personal goals.

The second of the LEP students, a young male Vietnamese by the name of Hoa, was a vocational student, studying design. Teacher B described Hoa to me as "a smart young man, with good recall." He had been in the country three years, had spent time on the west coast in bilingual programs and had recently moved to this city. He had been in this school in the drafting curriculum (a vocational-technical program) for the past four months. My experience of Hoa was that he had little interest in science, and was there only because it was a requirement. During our interview when I asked him speculative questions, rather than take a moment to consider an answer he promptly responded with "I don't have a clue." This was the typical response issued by many of the EP students in his class when they didn't want to take part in a class discussion. He told me he liked being in easy classes, "where

you don't have to memorize, do lectures or write reports." He preferred to do his drafting.

Pei, the third LEP student in Teacher B 's class, was a young man from Cambodia who planned to go to college. This was the second year that Teacher B was teaching science to Pei; he had been in her non-college preparatory Chemistry course the previous year. When I asked Teacher B early in my observations about Pei's academic abilities and plans she told me that he can have conversations with her, can explain things orally, but in reading and writing he has trouble. "He could never make it in college. But he tries <u>really</u> hard." Pei had been in this country and in one school system for the past six years. Of his own volition, he had not taken part in bilingual programs. His plans were to become a computer programmer. I asked him why he was taking non-college prep courses and it was clear by his answer that he was not aware of the distinctions between the various levels of science classes. He was following his counselor's directions and he trusted that his counselor was appropriately preparing him for college admission. I also asked him about taking part in class. He did not see interaction as important "as long as you know what's going on". In fact, to Pei, class interaction was tangential to the real course content, stating that students often bring up topics to pull the teacher away from the course content. Pei's assessment of the class environment was accurate; many times the student talk was of a social or disruptive nature. "Personally, I don't talk in class. If I don't have a clue, then I ask. If I have a little idea, I don't ask a question." Given the environment of this "Integrated Science" class, Pei had determined that he had no need to talk aloud in class.

When I asked Pei questions of higher-cognitive levels, he was willing to consider and ponder the issues as the following text shows. When asked questions demanding particular recall regarding mitosis, he asked permission to go to his notes and tried to echo the verbatim answers that the teacher had earlier provided. Yet when asked to speculate what would happen if mitosis did not occur, he provided an extended answer about how we would die, projecting how, if cells were not replaced, our skin pores would ultimately close up, thus disallowing the elimination of waste, causing ultimate death of the organism.

((Interviewer and Pei have been discussing what mitosis is. Pei could give the definition that is written in his notes. Interviewer then asks Pei to describe mitosis in his own words. He has difficulty. So interviewer asks him about a part of mitosis, daughter cells.))

1	I:	She was talking about daughter cells. What are daughter cells?
2	P:	Daughter cells is (3) the new cell, like, that (3) form from mitosis.
3	I:	So mitosis is the forming of new cells? (3) Is that what it is?
4	P:	The mitosis is like, they call it the mother cells. And the mother cells give off, (2) break up into a daughter cells, like (4) mmm
5	I:	Tell me what you are thinking
6	P:	Like, the mother, the mother cells produce another cell? And then they call it daughter cells.
7	I:	The mother cell actually becomes two cells? Is that what happens?
8	P:	Yeah, yeah.
9	I:	One cell becomes=
10	P:	=daughter cells.

11	I:	daughter cells. Hmm.
		((Interview questions about where mitosis happens.))
12	P:	It's happening in our bodies.
13	I:	It happens in our bodies?
14	P:	It, it, it just not our bodies, . . like animals and stuff. Animals. Anything that reproduce, you know.
15	I:	Where does it happen in our bodies?
16	P:	I think it's, ((chuckles))
17	I:	Does it happen like, do our skin cells do it? Do our muscle cells do it?
18	P:	Yeah, I think it happen everywhere. It goes like, anyplace that has cells and stuff.
19	I:	Uh-huh. So let's take, for example, our skin.
		((The two talk about cells dying and how skin cells fall off.))
20	I:	What would happen if mitosis did not occur?
21	P:	We'd probably die. Because like, you know in the skin they have like a little hole by the hair come out?
22	I:	Yeah.
23	P:	That's the waste, waste product for the cell.
24	I:	Uh-huh.
25	P:	When they, uh, when they die, it's like When you sweat, when you sweat, then kind of waters come out your body. If the cell die the skin, your skin won't be, you know full of (--), Like your body couldn't get out, in your whole body - probably all water.
26	I:	Uh-huh. So you're saying that if the cells died and did not replace themselves=
27	P:	=Yeah, and little, like, you know in the hair that it grows?
28	I:	The follicle?

29	P:	Yeah
30	I:	mm-hmm, in the hair follicle
31	P:	They probably be, if the cell die, those things might be close.
32	I:	Yeah
33	P:	And then you, then you When it close, the water in your body couldn't come out
34	I:	Yeah, no waste product
35	P:	No waste product gonna come out.

As this transcript shows, Pei's answers were grounded in content, but the delivery of the answers was weak. It took a listener with the ability and commitment to negotiate meaning and to stay on topic through extended repair work, for Pei's answers to take shape. My point – contrary to Pei's opinion, I think interaction would help him by allowing him practice expressing his thoughts, particularly given his goals for higher education. It could be argued that perhaps this practice would best be accomplished in a bilingual classroom with teachers trained to interact with LEP students, but at some point Pei would still need to begin to practice talking science in an English-medium classroom.

Analysis

Teacher B's classroom talk offers both examples of how to provide highly interactive environments for LEP students and examples of teacher talk that is prohibitive to LEP interaction. Table 6.1 presents a distribution of the total acts Teacher B used in her speech to EP and LEP students.

TOTAL	acts	I	S	R	F
EP (n=14)	890	145	23	156	566
LEP (n=3)	156	22	4	18	112

Table 6.1: Frequency of teacher acts in Initiation (I/S), Response (R), Follow-up (F) moves Teacher B.

A brief overview of results reveals that two of Teacher B's areas of differentiation – distributions of elicitations and directives to action, and use of display vs. referential questions – were highly dependent on particular class days and participant structures. A third area of differentiation found in Teacher B's input is the distribution of open-ended and closed questions. We will review the specific modifications in detail as we look at the research questions, one by one.

Opportunity to speak

Question 1: Do NS teachers interact with their EP and LEP students differently? Specifically, do teacher's discourse strategies which facilitate or inhibit a student's opportunities to talk as frequently and as purposefully as his/her classmates differ for EP and LEP students?

As in Teacher A's findings, answers to this first question were determined by comparing between EP and LEP populations: 1) the distribution of Initiation acts, 2) the distribution of overall elicitations and directives to action, 3) the distribution of cognitive levels of Initiation elicitations and overall elicitations, 4) the distribution of open-ended and closed questions, and 5) the frequency of turns and methods of turn allocation.

First, the mean length of students' turns in response to the teacher's checks, directives and elicitations was calculated to determine whether elicitations produced more speech opportunities for Teacher B's students. The results were as anticipated and similar to Teacher A's findings. All but two responses to checks were non-verbal, both verbal responses were from EP students. One was one-word in length; the other was five; thus the MLT in response to Teacher B's checks was 1.18 for EP students and 0 for LEP students. The MLT in response to Teacher B's directives was less than 1 for both populations, again due to the frequency on non-verbal responses: .85 for EP students and .36 for LEP students. Elicitations, in contrast, almost always resulted in a verbal response. The MLT of students' responses to closed elicitations was 1.54 for EP students and 1.76 for LEP students; for both populations the range of response was 1-6. The MLT of students' responses to open-ended elicitations was 5.3 for EP students (with a range of 1-15) and 2.0 for LEP students (with a range of 1-4). Again, it is clear in Teacher B's classroom talk, that elicitations result in greater speech opportunities than do directives or checks.

With regards to the distribution of acts in Initiation (I/S) moves, as Table 6.2 shows, in contrast to Teacher A, Teacher B did not use proportionately more directives or checks with the LEP students than the EP students. The most marked difference is the strong drop in Teacher B's use of any Initiation acts, especially elicitations, to LEP students during the last two days of classroom observation (in day labeled "discussion" – 68 acts to EP vs. 1 act to LEP; and during lab.2 – 25 acts to EP vs. 1 act to LEP). Because the teacher initiated so few transactions with the LEP students on these two days,

some expected cell frequencies are too small to make statistical claims about the differential distribution of Initiation acts. Nevertheless, regarding the frequency of elicitations, Teacher B issued more to EP students than LEP students by a 3:2 ratio.

Teacher B Class	EP				LEP			
(class grade)	acts				acts			
class event	c	d	ch	el	c	d	ch	el
lab.1	0	2	0	6	0	1	0	3
circle review	8	0	3	56	3	1	2	14
discussion	7	1	1	59	0	0	0	1
lab.2	5	4	0	16	0	0	0	1
Total:	20	7	4	137	3	2	2	19

Table 6.2: Distribution of acts in Initiation (I/S) moves
acts: c = comments; d = directives; ch = checks; el = elicitations
class events: T-G = full group discussion; T-SG = small group work

Teacher B Class	EP	LEP
lab.1	15	19
circle review	70	17
discussion	69	1
lab.2	32	1
Total:	186	38

Table 6.3: Distribution of all elicitations(I,S,R,F) according to class day

Furthermore, Table 6.3 shows that in an analysis of elicitation acts from all moves (I/S, R, & F) according to class day, in three of the four days, Teacher B used elicitations proportionately more frequently with EP students than with LEP students ($\chi^2 = 54.17$, $p < .001$).

Several comments must be made about the disparity of questions by Teacher B according to class event. First, the scarcity of elicitations to LEP students on the last two days of observed classtime may have a significant impact on many of the following statistics. While tendencies are indicated, significance may be difficult to establish because of the very small expected cell frequencies. Nevertheless, further research on these trends is warranted.

Second, the participant structure plays an important role in determining the interaction style of Teacher B and her LEP students. The class labeled "circle review" was a round-table question and answer routine; questions were delivered in a predictable fashion around the room three times. Consequently each student had at least three opportunities to answer questions. This equitable distribution of turns is reflected in the numbers in Table 6.2. The class labeled "discussion" was a teacher-fronted class discussion during which the teacher issued questions to the class in general and allowed students to self-select their opportunities to answer these questions by speaking out. Clearly this type of participant structure is not conducive to nurturing LEP participation.

Observations during the two lab days revealed two completely opposite interactional styles with the LEP students; one which facilitated frequent interaction, the other which prohibited interaction. The class day labeled "lab.2" is an example of a class during which the LEP students had minimal

opportunities for interaction. During that day, Teacher B had interacted in extended conversations on the day's science topic with every EP member of the class. She commented to me that this was one of the best classes that she had had with this group, that the level of questioning had been on target and involved, that the students indicated both interest and understanding of the content. The following two texts are examples of the richness of interaction which occurred that day. In a lab setting, students were testing unknown mineral samples, to determine if they were igneous, metamorphic or sedimentary. Readings in the text and handouts, provided clues as to what to look for to make these determinations. It should be noted that Hoa, the most vocal LEP student, was absent that day. Pei, the reticent LEP student, and the only student to my knowledge in that class who had plans to go to college, worked diligently and silently by himself (which was often his style). Cui, too, worked quietly on her own. The extended transactions were initiated by both the students and the teacher; if the student did not self-select the teacher-student transaction by issuing questions, the teacher made a point of going to the desk of every student and initiating a transaction. The first text is of an interaction initiated by the teacher. The student had been working quietly on his own so the teacher approached him and asked him how his magnifying glass was working.

1	T	((to Mitch)) Is that working out all right?
2	M	Except one thing
3		The packet and the book say two different things
4	T	What do you mean?
5	M	Ok, see you know that sample 1
6		It was like coal
7	T	Sample 1 wasn't coal

8	M	Well, anyway it was black like coal
9	T	It was black, yes
10	M	I put it under igneous?
11	T	Yes?
12	M	Right here it says igneous
13	T	Yeah,
14		but that there is a sample.
15		There's a whole bunch of kinds of. .
16	M	Oh, I guess I was right
17	T	That, the one that you saw there,
18		that's got that fracture like I was telling you about.
19	M	So that rock right there is igneous right?
20	T	Nope
21	M	It's metamorphic?
22		(----------)
23	T	I don't know
24		I'm just checking to see how that hand held thing works ((explaining why she's using the glass; then walks on))

In line 9, the teacher guided Mitch through modeling, how to be precise in his descriptions. And in lines 14 and 15, she challenged Mitch's answer choice. In line 18, she compared certain features of his mineral with a rock they had previously observed. While the teacher was not willing to give Mitch the answer (lines 20 and 23), there was considerable interaction, both of words and thoughts in this transaction.

Following is another example of the richness that occurred in the teacher-student transactions that day. This transaction, too, was initiated by the teacher.

1	T	((to two girls working together, Tammy and Janine))
2		Do you know what this is?
3	Ta	Yeah, metamorphic.
4	T	Why do you say it's metamorphic?
5	Ta/J	Because it has lines in it.
6		It's crushed (----)
7	T	It's not though.
8	Ta	It's not.
9	T	But I understand why she would say that.
10		Feel that,
11		Feel it.
12		What does that feel like to you?
13	J	A rock.
14	T	No, no, no, no ,no
15		Is there anything that you have ever felt, that it feels like to you?
16	J	No
17	T	No, no
18		You've never felt anything like this before.
19		Sandpaper, sandpaper?
20	J	I was gonna say sandpaper.

This transaction continued for another eight teacher turns. Notice the higher cognitive level Follow-up elicitation in line 4, and the other Follow-up elicitations in lines 12 and 15. These students were asked to reason, to explain, and to compare to their own experiences.

The previous two samples of text are indicative of the rich, ongoing teacher-student interaction that occurred during that lab day. During this class period, every student, except Pei, was involved in an interaction with the teacher, 50% of which were initiated by the students, and 50% initiated by

the teacher. In contrast to this talk is the only transaction that occurred that period between Teacher B and an LEP student. The full text of the transaction follows:

1	T	How are you doing Cui?
2	C	OK
3	T	All right?
4		OK.

The teacher was unaware of this disparity of her talk that day to EP students vs. LEP students. As mentioned earlier, Teacher B expressed to me after that class that she felt that this class had been one of the best classes she had experienced with this group. While this class was, indeed, one of the most interactive and purposeful lessons Teacher B had had with these students during my observations, it was not an interactive experience for the LEP students. They were virtually invisible.

In contrast, on the first lab day Teacher B's interaction style with LEP students was most facilitative. This day, Teacher B not only issued considerably more elicitations to the LEP students than on the two "barren" days, but, as Table 6.3 shows, she actually issued more total elicitations to the LEP students than to the EP students (15 elicitations to 14 EP students; 19 elicitations to 3 LEP students)! In review of the text, one finds that the teacher was extremely responsive to guiding two of the LEP students on the procedure of the lab experiment, by issuing a series of elicitations. Such attention to the LEP students can serve as a model for how to guide those students who may have less ability in understanding the initial instructions.

The exemplary strategy which Teacher B employed during this lab day was to ensure that the LEP students understood what to do in the lab, not by asking them, "Do you understand?", but rather by asking them Follow-up questions and Response questions which indicated their understanding. Consider the following text. The students were working independently, testing 10 identified minerals to determine their chemical and physical properties. The written instructions include a step by step procedure of how to test the minerals. Part of these instructions read as follows:

> 3. Record the actual color of the specimens in column 3.
>
> 4. Rub each sample on a clean streak plate, record the actual color of the streak powder in column 4.
>
> 5. Using the nail, scratch the mineral. If the mineral is harder than the nail record HN in column 5; if the mineral is softer record SN.
>
> 6. In column 6, record any striking characteristics you may have observed in each rock sample.

One of the LEP students, Hoa, had called Teacher B over to him. This was the first of four times that Hoa was to call on the teacher for assistance during this class hour. He was working on Procedure number 3 and asked her a question about what color he should write down. The teacher replied:

1	T	Which one?
2	H	(-------all different color----)
3	T	OK, what color is this to you?
4	H	White
5	T	Is it white?

6	H	Yeah
7	T	Or is it clear?
8	H	Clear
9	T	Clear
10		Then that's what you write, "clear".
11	H	And this?
12	T	OK and this is the streak plate, all right?
13		Find a clean spot.
14		You can wash this off sometimes too with the water.
15	H	I already used it - it was white
16	T	So that's what you write down then
17	H	(----nail-scratch-)
18	T	OK, so you take your nail and you scratch it
19		And you see if it scratches.
20	H	((reading the last instruction about striking characteristics))
21	T	Any striking characteristics?
22		Is there anything about this that you've noticed?
23		What is this- this is halite, huh?
24	H	No
25	T	All right, so that's what you'd write
26		You'd write "no"

In line 3, rather than answer the question for Hoa, the teacher reversed the direction of inquiry, making it clear to Hoa that it is his decision about color that matters, not the teacher's. However, when he answered "White", the teacher suspected that there may be a vocabulary issue here, that, in fact, he may be experiencing the color of "clear" and just not have the vocabulary to say so. So she followed up in lines 5 and 7 with two more questions. Now that Hoa had the teacher's attention he indicated in his question, line 11, that

he wanted her to "walk him through" procedure number 4 also. Teacher did this with a series of directives to action, in lines 13, 14, and 16. Procedure number 5 was handled the same way, with a statement/question from Hoa in line 17, indicating he wanted her to guide him through Step 5, followed by two teacher directives to action, lines 18 and 19. Hoa and the teacher continued to work through the procedural protocol as Hoa read aloud procedure number 6. In lines 21 and 22, Teacher B translated the instructions just read by Hoa into her own words in the form of questions. Hoa answered her questions in line 24. She followed-up with one more directive to action. Teacher walked away, with both teacher and student seemingly more secure about this particular student's ability to continue the process with the other 9 minerals for the rest of the lab period.

The LEP students' need for extensive personal attention regarding laboratory procedure might also suggest that additional framing by the teacher at the beginning of class might be appropriate. Framing was also mentioned in our discussion of Teacher A. In my post-taping interview with Hoa, I had asked him what teachers might do to be more helpful to ESL students. His only real suggestion was that they might walk students through an experiment before expecting each student to work independently. This is how his teachers had done it in California where he had been until 6 months ago; he thought this was a much more helpful way to introduce lab procedures. What Hoa was describing was his need for framing. This teaching method will be discussed in detail in Chapter 8.

As noted in the previous chapter, one of the distinct modifications found in Teacher A's talk was that he used more directives with LEP students

and slightly more elicitations with EP students. While there is no difference in Teacher B's use of directives to action in her Initiation-only moves, Table 6.4 indicates that in an analysis of all four moves, Teacher B did use directives to action proportionately more frequently with LEP students, and elicitations with EP students ($\chi^2 = 9.44$, $p = .0021$). As with Teacher A, given the actual frequency counts and the population size for each group the increase of elicitations to EP students is slight (with a EP : LEP ratio of 13 : 12); however, the increase of directives to LEP students is more striking (with a EP : LEP ratio of 1 : 3).

Teacher B	EP (n=14)	LEP (n=3)	EP:LEP rel.freq.
directives	49	26	1 : 3
elicitations	186	38	13 : 12

Table 6.4: Differential distribution of all directives (d) and elicitations (el), and comparison of relative frequencies

With regards to a student's opportunity to speak as purposefully as his/her classmates, the cognitive levels of Initiation elicitations were analyzed. Table 6.5 shows that Teacher B used high level cognitive questions with her students infrequently. Consequently, although zero higher cognitive questions were issued in the Initiation moves to LEP students, no statistical claims of differential use can be made. This undifferentiated use of high and low cognitive levels of questions persists throughout Teacher B's

Teacher B Class	EP		LEP	
	H	L	H	L
lab.1	0	5	0	2
circle review	0	52	0	12
discussion	11	41	0	1
lab.2	2	11	0	1
Totals:	13	109	0	16

Table 6.5: Higher (H) and lower (L) cognitive levels in Initiation (I) elicitations

talk. Of the total questions (that is, in all four moves: I/S, R, and F) issued by Teacher B, the high : low ratio was 24 : 167 for EP students and 4 : 34 for LEP students.

Teacher B Class	EP		LEP	
	O	X	O	X
lab.1	8	7	5	14
circle review	21	49	2	15
discussion	33	36	0	1
lab.2	11	21	0	1
Total:	73	113	7	31

Table 6.6: Distribution of open (O) and closed (X) questions in all moves (I,S,R,F)

Also considered in measuring students' opportunities to speak is the distribution of open-ended and closed questions. As Table 6.6 shows Teacher

B issued more overall open-ended questions to EP students than to LEP students ($\chi^2 = 5.09$, $p = .0241$). Table 6.7 indicates similar findings for Initiation-only elicitations ($\chi^2 = 5.15$, $p = .0232$). This differentiation is most

Teacher B Class	EP		LEP	
	O	X	O	X
lab.1	3	2	1	1
circle review	16	36	0	12
discussion	26	26	0	1
lab.2	2	11	0	1
Total:	47	75	1	15

Table 6.7: Distribution of open (O) and closed (X) questions for Initiation-only moves

noticeable during the "circle review" class when questions were elicited in an even distribution, going around the room in a circle formation. Referring back to Table 6.6, almost half of Teacher B's questions to EP students were open-ended that day. Only 2 out of a total 15 questions to LEP students were open-ended.

However, these two open-ended questions were part of a model strategy used by the teacher to safely and successfully engage one LEP student, allowing her to interact in front of the class at a level at which she was capable. During the circle review session the questioning format was quite rigid; that is, the teacher had agreed to ask each student one question, and if the student could not answer that question, the T answered it, and moved on to the next student. Extra credit points were tied into answering these

questions correctly, so the students had a vested interest in attending to the event. By the second and third round of questions around the ring, the format had become less rigid; the teacher now giving the floor to the group if a question was answered incorrectly, or expanding an errant student's turn by issuing a Follow-up question. (The extra credit point was not given if the initial question is not answered correctly; the students demanded strict adherence to this rule!) All of the Initiating questions in preparation for this test were low-cognitive level questions and the majority were closed-ended. This rigid format was first broken during the first cycle around the circle when the teacher came to Cui, the LEP female. The previous questions had been about a tulip. Teacher B asked Cui to recall if the tulip was a complete or incomplete flower, meaning does a tulip have both a pistil and a stamen or just one of the reproductive parts.

1	T	Was it a complete or incomplete flower, the tulip?
2	C	Complete?
3	T	It was a complete flower.
4		Do you know why it was complete?
5	C	((signals no))
6	T	You don't know why
7		((looks out to the class))
8	S	Cause it had a pistil and a stamen
9	T	Because it had a pistil and a stamen.
10		They had the male and the female reproductive parts.
11		((to Cui)) That's okay,
12		I'll give you that one.

In line 1, the teacher asked Cui a low cognitive level, "or - choice" question, providing her a 50% chance of answering correctly whether or not

she fully understood the material. Cui did answer correctly. But then the teacher continued to interact with Cui, issuing another question in line 4, a Scaffolding-initiating question; and this was the first "why" question, an open-ended question of a higher cognitive level to be asked during the class hour. Cui was unable to answer why but was given the extra credit point for correctly answering her first question. Teacher B repeated this same questioning format two out of the three turns that Cui had that period, initially asking a lower-level, closed-ended question, then challenging further with a higher-level, open-ended question. I asked the teacher afterwards about this strategy. She was aware of what she had done. Her reason was that she wanted to give Cui a chance to answer correctly; she also wanted to see if Cui knew what she was talking about. It was an excellent model of questioning for the LEP students (or for any student) who happens to be shy, less secure, and possibly struggling with the course content.

The final focus in the analysis of opportunity to speak is how turns to be part of a transaction were distributed. With regards to the frequency of overall transactions, 14 EP students participated in 185 transactions; 3 LEP students participated in 24 transactions. Therefore, EP students participated in transactions 1.5 times more frequently than the LEP students. With regards to turn allocation, Teacher B indicated no statistical differentiation in the use of designated turns and volunteered turns ($\chi^2 = 3.29$, $.05 < p < .10$). With EP students, 68 turns were designated by the teacher; 117 were volunteered turns. With LEP students, 14 turns were designated; 10 were volunteered. Interestingly, given the number of students (LEP - 3; EP - 14), it appears that Teacher B designated the LEP students as often as she designated EP students.

It is when the students have the opportunity to self-select the floor, or to bid for the chance to speak, that a trend toward differentiation appears; the EP students volunteered 2.5 times more often than did the LEP students.

To summarize findings with regards to opportunities to speak, Teacher B issued more Initiation elicitations to EP students than to LEP students in a 3 : 2 ratio. Overall, more directives to action were issued to LEP students. Differential use of elicitations was highly dependent on participant structures of particular class days. Teacher B tended to issue more high cognitive level Initiation elicitations to EP students; in fact, 0 high cognitive questions were issued to LEP students in the Initiation move. Teacher B also issued more open-ended questions to EP students. EP students had more transaction opportunities in a ratio of 1.5 : 1. Teacher B drafted EP and LEP students who had not volunteered for a turn nondifferentially; however, EP students were able to volunteer and self-select the floor more often.

Positive face needs

Question 2: Do NS teachers ratify the positive face needs of their EP and LEP students differently? Specifically, do a teacher's discourse strategies which function to indicate interest in students' thoughts, in their comments, and in the students, themselves differ for EP and LEP students?

Answers to this second question were determined by comparing between the EP and LEP populations: 1) the frequency of scaffolding elicitations, 2) the distribution of high cognitive level scaffolding elicitations, 3) the distribution of acts in the Response moves and Follow-up moves, 4)

the distribution of display and referential questions, 5) the use of personal detail, and 6) the use of non-reaction to a student's question.

class participant structures	moves	EP (n=14) elicitations	EP (n=14) total acts	LEP (n=3) elicitations	LEP (n=3) total acts
lab.1	F	6	76	13	65
	R	3	55	3	18
	S	1	8	1	4
circle review	F	14	206	3	38
	R	0	30	0	0
	S	4	67	2	20
discussion	F	10	164	0	7
	R	0	13	0	0
	S	7	68	0	1
lab.2	F	9	120	0	2
	R	7	58	0	0
	S	3	25	0	1
Sub-totals:	F	39	566	16	112
	R	10	156	3	18
	S	15	168	3	26
Total:		64	890	22	156

Teacher B

Table 6.8: Frequency of scaffolding elicitation acts in relationship to total number of acts in each move moves: F = follow-up; R = response; S = initiation-scaffolding

The first way this question is answered is to assess the frequency of scaffolding elicitations in their three distinct environments: i) reformulating

scaffolding, a follow-up move to a student error or to an insufficient student answer, ii) a question in response to a student question, thus reversing the direction of inquiry, and iii) a Scaffold-initiation question to further develop a student's previous correct answer. Table 6.8 indicates some interesting and unexpected results. Given the relative frequency counts, Teacher B issued overall more scaffolding elicitations to LEP students than to EP students in an approximate ratio of 1.5 : 1. This is primarily due to one class event, lab.1, during which Teacher B issued twice as many elicitations to LEP students than to EP students. This increase of elicitations to LEP students is similarly reflected in the distribution of act types. With regards to overall scaffolding moves Teacher B issued elicitations more frequently in speech to LEP students than to EP students ($\chi^2 = 6.04$, $p = .014$).

This distribution result was also unexpected given that during the final two of four class periods no elicitations were issued to the LEP students. The distribution count, however, indicates only how acts are proportionately distributed within the speech to a given group. Consequently on the two last days when Teacher B issued 0 elicitations to LEP students, the ratios for LEP students, such as "0 elicitations: 7 total acts" or "0 elicitations: 1 total act" (on the class day labelled "discussion"), are considered to be as proportionately distributed as the corresponding ratios, 10 : 164 and 7 : 68, for EP students. As a result, in all days but lab.1, elicitations are relatively proportionately distributed for EP and LEP students; and the sum total differential distribution which indicates a greater proportion of elicitations issued to LEP students is a function of that first lab day, when LEP students received proportionately many more elicitations. In this case, the absolute frequency

numbers depict an actuality quite different from the distribution proportions. Returning to the aforementioned ratios, issuing 10 Follow-up questions to EP students compared to 0 Follow-up questions to LEP students clearly has a significant and differential impact on students' opportunities to interact.

The large differences of Teacher B's frequency counts dependent on class days indicates that varying participant structures create significantly different interactive opportunities for LEP students. If the varying styles of these four class days are indicative of Teacher B's overall presentation style, then in the long run, the LEP students are receiving ample opportunities to interact. If lab.1 is the norm for lab days, then LEP students are receiving even more than their fair share of opportunities to talk to the teacher one on one. If, however, those days labeled "discussion" and "lab.2" are the norm for teacher-fronted discussion and lab experiences, then the LEP students are seriously limited in their opportunities for interaction with their teacher.

A second indicator of teacher interest in students' comments is provided by the cognitive level of the scaffolding questions. As Table 6.9 indicates no difference is found in Teacher B's use of higher cognitive questions, primarily because she did not use higher cognitive questions frequently in her class discussions.

A third way of measuring a teacher's expressed interest in the students' thoughts is to analyze the distribution of acts other than elicitations in the teacher's Follow-up and Response moves. Table 6.10 shows that when Teacher B issued Follow-up acts, she issued comments proportionately more frequently to EP students than to LEP students ($\chi^2 = 10.13$, $p < .01$). Moreover, Teacher B issued Follow-up directives to action more frequently to LEP

Class	Move	EP		LEP	
		High	Low	High	Low
lab.1	F	0	6	2	11
	R	2	1	0	3
	S	1	0	0	1
circle review	F	1	13	0	3
	R	-	-	-	-
	S	0	4	2	0
discussion	F	2	8	0	5
	R	-		-	-
	S	0	7	-	-
lab.2	F	4	5	-	-
	R	1	6	-	-
	S	0	3	-	-
Sub-Totals:	F	7	32	2	14
	R	3	7	0	3
	S	1	14	2	1
Totals:		11	53	4	18

Teacher B Table 6.9: Cognitive level of elicitations in each of the Scaffolding moves (F,R,S)

Teacher B	EP	LEP
F: accept	128	26
F: evaluate	20	1
F: comment	333	47
F: prompt	6	-
F: check	6	3
F: directive	33	19
F: cue	1	-
F: elicitation	39	16
Totals	566	112

Table 6.10: Differentiation in use of Follow-up acts

students than to EP students ($\chi^2 = 14.83$, $p < .001$). These results repeat a trend found with Teacher A, more comments to EP students and more directives to LEP students. It is premature to make any claim regarding whether or how this differential use of comments might indicate a teacher's differential interest in students' thoughts. Before such an analysis could be done, the "comment" category used in this study would need to be further refined. For this study, it is important to note that the increased use of directives to LEP students is found in the Follow-up move as well as in the Initiating move.

Table 6.11 indicates that a trend to issue proportionately more directives to LEP students than to EP students also exists in Teacher B's Response moves – her responses to students' questions. However, due to small expected cell frequencies, no statistical claim can be made.

Teacher B	EP	LEP
R: reply	135	10
R: prompt	-	-
R: check	2	-
R: directive	9	5
R: elicitation	10	3
Totals	156	18

Table 6.11: Differentiation in use of Response acts

Another way that a teacher can indicate interest in the student's thoughts and in the student him/herself is by asking questions of the student, the answers to which are unknown to the teacher. Table 6.12 indicates that Teacher B asked real, referential questions to the LEP students proportionately more frequently than to the EP students ($\chi^2 = 6.46$, $p = .011$). This result

Teacher B	EP		LEP	
Class	U	K	U	K
lab.1	14	1	15	4
circle review	0	70	0	17
discussion	7	62	1	0
lab.2	22	10	1	0
Total:	43	143	17	21

Table 6.12: Use of referential (unknown -U) and display (known-K) questions

appears to be a function of both the high frequency of referential questions issued to LEP students during lab.1 and the combined low frequency of any questions issued to LEP students on class days labelled "discussion" and "lab.2". From the results it is reasonable to claim that the strategy of questioning LEP students used during lab.1 is a model which indicates interest in the student; hence, it satisfies positive face needs.

Use of personal detail is another way to indicate interest in another interlocutor. Teacher B was the only teacher of the three analyzed who used personal detail during my observations. As Table 6.13 shows, Teacher B used

Teacher B Class	EP	LEP
lab.1	1	1
circle review	0	0
discussion	1	0
lab.2	7	0
Total:	9	1

Table 6.13: Use of personal detail according to class day

this convention with EP students more often than with LEP students. It was obvious during the observations of these personal detail episodes how rapport with students was established. Following is an example of the use of personal detail. This conversation occurred during lab.2; the teacher and student were standing at the table where the mineral samples were laid out. Jerome, a rock enthusiast, was fascinated by the fossils found in the samples.

1	J	((Jerome up at table))
2		I didn't know these were real fossils.
3	T	You didn't?
4	J	Well I thought this was uh just uh rock types.
5	T	They are rock types.
6	J	Yeah but this had shells in it.
7	T	That's right,
8		It's supposed to.
9		((returning to C,)) Here take a look at that one.
10	J	Is this coal?
11	T	Cool, huh?
12		Let me see.
13		No, it's not coal.
14	J	When I was up in Utah with my Dad
15		We go up to the mountains and find fossils
16		I found a bunch of trilobites and=
17	T	=You found trilobites!
18	J	Oh, yeah,there's places you can go up there and dig for trilobites.
19	T	Jerome, would you please go this summer and get me some.
20		Because um I was in Ohio, trying to find them and could not
21	J	Oh, there's a place up there and there's trilobites everywhere.
22	T	Oh, get them please.
23	J	Oh, yeah.
24	T	Oh, Jerome.
25	J	Sure.
26	T	They're fossils.
27		Oh, I found like bracheopods.
28		You know, they look like just shells.
29	J	yeah
30	T	But, oh, I want a trilobite.

31 J Oh, sure, no problem.

Teacher B attended to Jerome's personal detail, his interest in trilobites, and offered her own personal detail, her interest in acquiring such a mineral. Through their expressed common interest in trilobites, Teacher B and Jerome created a personal bond. Such rapport, through the use of personal detail, ratifies a student's positive face needs, those needs to be approved of, acknowledged, or liked.

The final discourse strategy analyzed for Research Question #2 was the number of times the teacher chose not to respond to a student's question when the student had the floor. No such behavior was found in Teacher B's talk.

To summarize the findings with regards to positive face needs, Teacher B issued more scaffolding elicitations to LEP students, but this frequency was highly dependent on one lab day. In contrast, during two of the four days of observation, LEP students received 0 scaffolding questions. Few high cognitive questions were used in the scaffolding position; thus, no differentiation was found. Teacher B issued more Follow-up comments to EP students and more directives in both Follow-up and Response moves to LEP students. More referential (answer-unknown) questions were directed toward LEP students, again due to one particular lab day. Finally, more personal detail was used with EP students.

Chapter 7: FINDINGS: Teacher C

Classroom Observations

Teacher C teaches in a junior high school in an urban center adjacent to a major New England city. The school is an old building in the center of town, containing elementary through 8th grade classrooms in addition to pre-K classes and inner-city social service programs. The inside of the school is filled with colorful murals depicting the multi-ethnic makeup of the school's youth.

No bells signal class changes. Children are frequently seen in the hallways during the class periods, suggesting a loose discipline structure. The school is historically known for its progressive approaches to education. Teachers are encouraged to nurture students' questioning, not only of content but of teachers' instructional intents. Students call their teachers by their first names.

The school is culturally mixed. A significant Haitian influence can be seen/heard among the students, the staff, and the physical decor. There is a bilingual Haitian program in the school. Also represented in the school is a group of students who are children of affluent professionals in the city. Numbers of well-known academicians send their children to the local city schools, hence to this school. So classrooms contain a rich blend of socio-economic statuses, as well as levels of parents' schooling.

Teacher C teaches science to a mixed seventh and eighth grade group. Her classroom contains five working tables. Students are assigned to a particular table and work either in pairs or individually. The front blackboard

contains lists of points to be covered in the day's classes; it may also contain lists of assignments and due dates. Adjacent to the classroom is a mini-greenhouse filled with growing plants. A fishtank bubbles in the back of the room alongside a bird who sings in the middle of classtime.

Out of the 21 students, 3 were defined by Teacher C as limited-English proficient. These three had been mainstreamed from the bilingual program in January; they had been in this science class for three months. The science class was the first content classroom for these LEP youths. One of the reasons administration had chosen the science classroom for the first mainstreaming was because Teacher C had been working with the bilingual teacher in the bilingual science course for the past two years; therefore she and the LEP students already knew each other well. Outside of class, Teacher C was voluntarily part of a special training program on how to deliver academic content in more successful ways to bilingual students.

While 3 students were designated as LEP, other students in the classroom were clearly in advanced stages of language transition; some spoke with accents, and others freely moved into Haitian Creole during free talk. One other student was a female from Holland whom the teacher described as quite capable in speaking and reading English, but who showed small English problems in her written work. However the teacher did not include her in her description of limited-English proficient.

The three LEP students were all experiencing their first mainstreamed content class in this science classroom. Djinane, a female, had been in bilingual programs for four years. She was very outgoing, overly sociable, loved to talk to everyone. Teacher C often had to settle her down in the

classroom. Djinane said she wanted to be a singer or a dancer when she grew up. Julien, the male student, had been in bilingual programs for three years but had moved about the city in those three years and had only been in this school for the past year. He was very serious and eager to do his school work correctly while he was in the classroom. He actively pursued the assistance of any resource person in the room, including myself. Oftentimes, during the small group/ individual lab work, Julien corralled the single resource person in the room to work with him almost exclusively. However, Teacher C pointed out during class that when Julien was behind in work and was given the opportunity to come to the classroom after school, he did not show up. Julien told me he wanted to be either an electrician or a basketball player. He also prided himself on his artistic abilities and made it a point to show me his artwork – a journal of freehand drawings. Mariette, the most serious of the three had been in bilingual programs for 2.5 years. She wanted to be a lawyer. During our interview she asked pointed questions about the college path necessary to become a lawyer and about lawyer's salaries. Mariette was described by the teacher and by co-researchers, who work on the aforementioned training program of which Teacher C was a part, as a very capable and serious science student, a leader in the bilingual classroom.

Students move about the room freely. They also talk freely at all times during the class. Teacher C begins a class session usually in the whole-class format giving extensive instructions. Often the class hour plans contain more than one activity. Teacher C goes over each activity at the beginning of class. This teacher had noted to me that she felt frustrated about how she delivered class assignments and how the students seemed not to be able to

follow the assignments, that she felt she was putting out fires during the rest of the period, that students seemed to be unable to follow what she believed to be explicit directions.

In my observations of Teacher C, I noted that her directions given during whole-class discussion time were indeed, sufficiently detailed. However, they were lengthy, extended instructions and they were multifaceted; that is in one sitting she would discuss one assignment due in 40 days, then discuss three assignments each of which were to be done during the next class hour. Teacher C's tolerance for side talk was quite high; therefore, while instructions were given pockets of students were almost always talking amongst themselves. Also, Teacher C promoted students' questioning at any time and the students were allowed to take the floor for a question by calling out her name or by calling out the question. So, simultaneously while the teacher had the floor to explain these multifaceted assignments, there was ongoing student talk in side conversations and/or students trying to self-select for the floor at any time by calling out the teacher's name.

Oftentimes, the teacher would defer to one of the students and answer his/her question. Oftentimes these question/answer routines would change the direction of the topic and the teacher would forget to return to her original point. Some of the students were clearly able to follow successfully the extended directions of teacher C; these students appeared to be students who were well-steeped in academic tradition. Other students (including two of the LEP students, Julien and Mariette) worked hard to attend to the extensive directions but were often caught up by all the extraneous activity

and talk that was going on about them. Another group of students seemed to have become accustomed to attending minimally to the teacher's mini-lectures; rather they would doodle on paper or visit with another classmate and call out freely if they chose to ask a question. Often these students were the first to call out when the students were told to get into their small groups and to get to work and would ask the teacher "What do you want us to do?" And Teacher C would explain one-on-one to these students what she had just gone over in such detail to the entire group.

In my discussions with Teacher C, I described her style as polyphasic; that is, she was personally comfortable dealing with several topics at once. In fact, she admitted to me that when she was not juggling multiple topics, she often felt as if she were wasting time. On the other hand, the students in this 7/8 grade science classroom seemed to respond more successfully to a more monophasic style. On one of the days observed, the teacher said at the end of the class period that she felt this class had gone much more smoothly than many of her other classes. When we looked at why, we realized that the students had been assigned one task to do that day - to organize their portfolios. And the assignment had been framed by modelling an example and by using a handout filled with instructions. Although the task was complicated , the students were better able to focus because they were all focusing on one task.

Teacher C's class was a beautiful example of inner-city ingenuity and use of resources. Oftentimes a special education teacher was present in the classroom to work with a select few students. This special education teacher would also work with Julien, the LEP male, simply because he was seated at

the same table as those students who needed the special teacher's help. Also present in the classroom on other days were teacher aides, one a graduate student at a local university, another, a retired inner-city school teacher.

Oftentimes students were called out of the room, or a teacher would come into the room to deliver a message to a particular student; oftentimes the LEP students' schedules were in conflict with the science schedule and Teacher C would need to work around the LEP students' need to leave early or to miss an important lecture. She remained considerably flexible given what could have been interpreted as numerous interruptions into her classtime.

The two most noticeable traits of Teacher C's talk were: 1) the already described polyphasic quality - managing a variety of topics at once and allowing constant interruptions, and 2) an apparent focus on "processing paper" as opposed to "talking science". It became clear through observation, however, that this attention to paper was actually Teacher C's vehicle through which she attended to the science content. For example, on a given day, Teacher C discussed the spring journal assignment, what to write in the journal, what to observe, how often to write in the journal, etc. She then proceeded to discuss what the students needed to do on that lab day – to go to their science notebooks and fill out a particular chart about fast plant observations and at the same time to fill out a small sheet she was to hand out, which asked the students to list how many assignments they had due and why they were late. Often the actual talk was about filling in papers or handing in papers. It was the text on the papers that asked the real content questions and often asked the higher-level cognitive questions (for example,

"How is the tomato plant like your fast plant?"). With this instructional style, much of the classroom talk was about putting papers in order, cutting and gluing papers to notebooks, looking for lost papers, determining if papers had or had not been handed in, etc. Missing from the talk were opportunities to share their findings about their fast plant observations, and their determinations about the similarities and differences of their fast plants to tomato plants. I would imagine that Teacher C had found attending to these paper assignments as a means to an end, given her polyphasic operational style. What the students missed with this style was the opportunity to interact with each other and with the teacher about the content. Hence, they were missing opportunities to co-construct science knowledge.

Teacher C admitted to me that she wanted to implement more discussion of these types in her classroom. She mentioned that in the bilingual classroom the students were very eager to participate in these types of discussions, yet she had found that in the monolingual classrooms, the students seemed reluctant to talk about academic findings – they were "too sophisticated", didn't have that "sense of wonder." Yet, as she continued to talk about it she realized that when she had tried putting the kids into a circle they did respond, in her words, "They can get into that mode." She suggested that she really ought to try more of that, but felt pressed by curriculum and time constraints.

Analysis

Table 7.1 presents a distribution of the total acts Teacher C used in her speech to EP and LEP students. Unlike the other two teachers, this teacher's

distribution of I, S, R, and F acts was disproportionate for T-EP and T-LEP transactions. As the table shows, Teacher C used I/S acts proportionately more frequently with LEP students than with EP students, suggesting that she initiated transactions more frequently with LEP students than with EP students ($\chi^2 = 40.09$, $p = .0001$).

TOTAL	acts	I	S	R	F
EP (n=18)	807	118	19	340	330
LEP (n=3)	298	79	18	79	122

Table 7.1: Frequency of teacher acts in Initiation (I/S), Response (R), Follow-up (F) moves Teacher A

A brief overview of results reveals that the differentiation found in the talk of Teacher C includes the distribution of elicitations and directives to action, and the differential use of high/low cognitive level questions and referential/display questions. The differences found in Teacher C's talk were highly dependent on participant structures. Teacher C used two very defined participant structures, the teacher-fronted discussion and the small group/lab experience. These two participant structures were distinctly demarcated in her classroom; for example, half of the classtime might be full class discussion (T-G) and the second half, small group lab (T-SG). Because of these clear demarcations and because these two participant structures generated such different usage of the coded acts, the analyses presented below are grouped by the two varying participant structures rather than by the various class days, as

with the other two teachers. Once again, we will review the specific modifications in detail as we look at the research questions, one by one.

Opportunity to speak

Question 1: Do NS teachers interact with their EP and LEP students differently? Specifically, do teacher's discourse strategies which facilitate or inhibit a student's opportunities to talk as frequently and as purposefully as his/her classmates differ for EP and LEP students?

As with the other two teachers, answers to this first question were determined by comparing between EP and LEP populations: 1) the distribution of Initiation acts, 2) the distribution of overall elicitations and directives to action, 3) the distribution of cognitive levels of Initiation elicitations and overall elicitations, 4) the distribution of open-ended and closed questions, and 5) the frequency of turns and methods of turn allocation.

Also, as with the other two teachers, the mean length of students' turns in response to the teacher's checks, directives and elicitations was calculated. The findings were similar indicating that elicitations do result in greater speech opportunities. For Teacher C, the MLT in response to closed questions was 1.5 for EP and LEP students with turn length ranging from 0-8 for EP students and 0-4 for LEP students. The MLT for open-ended questions was 4.4 for EP students (with a range of 0-10 words) and 4.25 for LEP students (with a range of 0-9 words). In response to checks and directives, again the frequent use of non-verbal responses resulted in MLT measurements of less than 1. The MLT in response to directives was .16 for EP students and .57 for

LEP students; the MLT in response to checks was .39 for EP students and .45 for LEP students.

The first element analyzed was the distribution of acts in Initiation (I/S) moves with particular attention to the distribution of elicitations vs. directives to action. Table 7.2 shows that 50% of Teacher C's Initiating acts to EP students were elicitations, while only 25% of her Initiating acts to LEP students were elicitations. Similarly, Teacher C initiated a greater proportion of directives to action to LEP students than to EP students ($\chi^2 = 16.88$, $p = .0007$). While the proportionate distribution indicates an increased use of elicitations for EP students, the frequency of Initiation elicitations indicates

Teacher C Class	EP				LEP			
	acts				acts			
class event	c	d	ch	el	c	d	ch	el
T-G	23	4	1	41	0	1	0	4
T-SG, lab	38	10	0	20	46	25	2	19
Total:	61	14	1	61	46	26	2	23

Table 7.2: Distribution of acts in Initiation (I/S) moves
acts: c = comments; d = directives; ch = checks; el = elicitations
class events: T-G = full group discussion; T-SG = small group work

the reverse. Overall, 18 EP students received 61 elicitations, while 3 LEP students received 23. Twice as many elicitations were issued to the LEP students than the EP students.

The participant structure had a striking effect on Teacher C's differential use of Initiating acts. During small group and individual work,

she issued altogether more I/S acts to the three LEP students than to the 18 EP students combined (92 to LEPs; 68 to EPs)! On the other hand, considerably fewer I/S acts were directed to the LEP students during teacher fronted whole class discussions (5 to LEPs; 69 to EPs).

This difference according to participant structure also affected the distribution of overall elicitations (in all four moves). As Table 7.3 shows,

Teacher C

Class event	EP (n=18)	LEP (n=3)
T-G	42	4
T-SG, lab	53	31
Total	95	35

Table 7.3: Distribution of all elicitations according to participant structure (in all moves: I,S,R& F)
Event: T-G = teacher-fronted discussion; T-SG = small group lab

in teacher-fronted discussions, Teacher C issued elicitations to EP students twice as often than to LEP students; but in individual and small group work, she used elicitations three times more often to the LEP students ($\chi^2 = 10.63$, $p = .0011$). The overall effect is that LEP students received twice the number of total elicitations.

Frequent elicitations directed to LEP students during small group work is not to be unexpected. Small group and individual work is an ideal time for teachers to make sure LEP students are on track and to give them time to speak without being embarrassed in front of the whole class. However, the unusually high number of elicitations issued to LEP students during the

small group work was unexpected. Clearly, Teacher C spent much of her interactive time during small group work with the three LEP students in the classroom.

Despite this varying use of elicitations based on participant structures, the overall differential use of directives to action shows the same pattern as for the other two teachers as Table 7.4 indicates. Given all four moves (I, S, R, F) Teacher C issued directives to action four times more frequently to LEP students than to EP students ($\chi^2 = 5.58$, $p = .0182$).

Teacher C	EP	LEP	EP: LEP rel. freq.
directives	84	59	1 : 4
elicitations	95	35	1 : 2

Table 7.4: Differential distribution of all directives and elicitations and comparison of relative frequencies

Proceeding to the purposefulness of the talk, Table 7.5 shows that the EP students received all the higher cognitive level questions produced by Teacher C as initiations ($\chi^2 = 16.77$, $p = .0001$). Similarly, 50% of all Teacher C's questions (in all four moves) issued to EP students were higher cognitive level questions; while only 18% of those questions issued to LEP students were ($\chi^2 = 12.77$, $p = .0004$).

But there is a factor outside of language development or teacher input which contributed to the LEP students' non-participation in the T-G whole

Teacher C Class event	EP		LEP	
	H	L	H	L
T-G	28	9	0	4
T-SG	6	10	0	11
Totals:	34	19	0	15

Table 7.5: Higher (H) and lower (L) cognitive levels in Initiation (I) elicitations

classroom speech event. One observed class discussion on dominant/recessive genes was a first day review of the concept, which had been introduced the day before. On the previous day, the LEP students were not in class; they were on a field trip for the bilingual program. Hence, they had missed a very important lecture/lab on dominant/recessive genes. This scheduling conflict apparently was not unique. On another of my days of observation, specifically, the day in which students had a dual period to update their portfolios, the LEP students were again called out of the classroom after the first of the two periods. Teacher C had mentioned to me the frustration of trying to help the LEP students "catch up" on content because they had been mainstreamed into this content classroom mid-year. In Teacher C's words, "How can I talk to them about cell reproduction when they don't even know the parts of the cell? That's what we've been working on all last semester." This scenario is revealing of the frustrations felt by the content teacher and presumably by the LEP students in their desire and need to be two places at once.

Also considered with regards to students' opportunities to speak is the distribution of open-ended and closed questions. As Tables 7.6 and 7.7 show,

Teacher C				
Class Event	EP		LEP	
	O	X	O	X
T-G	27	15	0	4
T-SG, lab	30	23	16	15
Total:	57	38	16	19

Table 7.6: Distribution of open (O) and closed (X) questions in all moves (I,S,R,F)
Event: T-G = teacher-fronted discussion; T-SG = small group lab

Teacher C				
Class	EP		LEP	
	O	X	O	X
T-G	25	12	0	4
T-SG, lab	10	6	6	5
Total:	35	18	6	9

Table 7.7: Distribution of open (O) and closed (X) questions for Initiation moves only
Event: T-G = teacher-fronted discussion; T-SG = small group lab

there is a tendency for Teacher C to issue proportionately more open-ended questions to EP students than to LEP students, but the difference is nonsignificant. This trend is stronger in the Initiation elicitations with a 2:1, open: closed ratio for EP students and a 1:1 ratio for LEP students ($\chi^2 = 2.31$, $p = .1283$). Sheer increased frequency of elicitations issued to LEP students in the

lab events counters any distributional effect. Note, however, that 0 open-ended questions were issued to LEP students during full-class discussions.

The final focus in the analysis of opportunities to speak is the allocation of turns to be part of a transaction. Regarding the frequency, unlike Teachers A and B, Teacher C provided opportunities for LEP transactions twice as frequently as for the EP students. Eighteen (18) EP students participated in 124 transactions; 3 LEP students participated in 43 transactions. With regards to turn allocation, for EP students, Teacher C designated 33 turns and allowed 91 volunteered student turns. For LEP students, the teacher designated 23 turns and allowed 20 volunteered student turns. These figures indicate that Teacher C designated LEP students to take turns proportionately four times more frequently than EP students ($\chi^2 = 9.18$, $p = .0025$). This behavior is indicative of Teacher C's instructional style – extremely attentive to the LEP students during small group work; and very responsive to student's self-selection of the floor as earlier described.

To summarize findings with regards to opportunities to speak, Teacher C issued overall more elicitations to LEP students; but this was highly dependent on participant structure. In full class discussions, twice as many elicitations were issued to EP students; in small group lab events, three times as many elicitations were issued to LEP students. Overall more directives to action were issued to LEP students. All high cognitive level questions in the Initiating move were issued to EP students; in overall questions, more were issued to EP than to LEP students. More open-ended questions were issued to EP students in full-class discussion. LEP students had twice as many transaction opportunities as did the EP students, due to the lab setting.

Finally, Teacher C recruited LEP students who had not volunteered more frequently than EP students.

Positive Face Needs

Question 2: Do NS teachers ratify the positive face needs of their EP and LEP students differently? Specifically, do a teacher's discourse strategies which function to indicate interest in students' thoughts, in their comments, and in the students, themselves differ for EP and LEP students?

Answers to this second question were determined by comparing between the EP and LEP populations: 1) the frequency of scaffolding elicitations, 2) the distribution of high cognitive level scaffolding elicitations,

		EP (n=18)		LEP (n=3)	
participant structures	moves	elicitations	total acts	elicitations	total acts
T-G/ discussion	F	1	132	0	6
	R	0	121	0	14
	S	4	69	0	5
T-SG/ small group work	F	17	198	8	116
	R	16	219	4	65
	S	4	68	8	92
Sub-totals:	F	18	330	8	122
	R	16	340	4	79
	S	8	137	8	97
Total:		42	807	20	298

Teacher C

Table 7.8: Frequency of scaffolding elicitation acts in relationship to total number of acts in each move
moves: F = follow-up; R = response; S = initiation-scaffolding

3) the distribution of acts in the Response moves and Follow-up moves, 4) the distribution of display and referential questions, 5) the use of personal detail, and 6) the use of non-reaction to a student's question.

In the assessment of scaffolding elicitations in their three distinct environments, as Table 7.8 shows, no differences were found for Teacher C, either in the overall distribution of scaffolding elicitations or in the particular S, R, and F moves. With regards to actual frequency counts it should be noted, however, that no elicitations were issued to LEP students in the T-G full class discussion. In contrast, 2.5 times as many elicitations were issued to LEP students in the T-SG lab participation structure as to EP students.

In addition to the frequency of the scaffolding elicitations, the cognitive levels of these elicitations were analyzed. As Table 7.9 shows, for Teacher C no difference was found. Again it should be noted, however, that zero scaffolding questions were addressed to the LEP students during the T-G participant structure. The finding of no difference in the cognitive levels of the scaffolding elicitations is unexpected, given the significant difference found in the Initiation elicitations (Table 7.5). To understand why this difference occurs, it is helpful to review a large sample of the actual questions that Teacher C produced.

Following is a list of Teacher C's elicitations. Higher-cognitive level questions are coded with an (H) following the question. Upon review, one sees that the significant differential use of high cognitive questions found in Initiation moves but not in scaffolding moves is dependent upon participant structure. Higher cognitive questions were found most often in the full class discussions, and then primarily in Initiation moves. Questions found in the

Class	Move	EP		LEP	
		High	Low	High	Low
T-G	F	0	1	-	-
	R	-	-	-	-
	S	2	2	-	-
T-SG/P	F	4	12	2	6
	R	8	8	2	2
	S	0	4	1	7
Sub-Totals:	F	4	13	2	6
	R	8	8	2	2
	S	2	6	1	7
Totals:		14	27	5	15

Teacher C Table 7.9: Cognitive Level of elicitations in each of the scaffolding moves (F,R,S) moves: F = follow-up; R = response; S = initiation-scaffolding

small group lab events were often procedural and of a low cognitive level in speech to both student groups. The lab events contained both Initiation and scaffolding elicitations; hence, cognitive levels of scaffolding questions were nondifferentiated in their distribution to EP and LEP students.

T-EP elicitations in small group, lab events

Where's the sheet I gave you at the beginning of class?
Did you write something down?
What thing do you need? You really don't have it anywhere in your bag?
How are you doing?
Have you filled in this little sheet?
Did you give me a decomposition thing [paper] today?
How is your plant like a tomato plant? (H)
What are you going to do when I give you this paper?
Did you do the chromosome thing?
Where is the reading I gave you?
Guiding students as they set up portfolios to analyze their own performances:
Why is it that you have 2 late out of 12? (H)
What does your egg experiment show evidence of? Why are you so good at it? (H)
Where does this go? What skill is this showing you? (H)

It should be noted that the last three questions in the above list are not classroom management questions. The teacher is guiding the students in the process of using a portfolio to track their own performance, to learn how to be self directive in their classroom behaviors. So these types of questions are not reprimands, but genuine questions, the intent of which is to get the students to analyze and critique their own behaviors.

Notice the similarity of question types as we next see samples of T-LEP talk in the lab-type event.

T-LEP elicitation in small group, lab events:

Did you see your grade for the last report?
Tell me what color's the pod.
Whose [paper] is this? Is this yours?
When you get your plant, I want you to tell me what color is the pod?
Keep thinking, how is this tomato like my plant? (H)

Are you going to glue that here?
What do you mean, what numbers?
Do you understand what I'm talking about up there?
Guiding students as they set up portfolios to analyze their own performances:
How many assignments have you done?
How many of those are late? My question is, why is that? (H)
Why are half of your assignments not turned in to me? (H)

Full-class discussions contained considerably more Initiation-elicitations than scaffolding elicitations. Higher cognitive level questions were found most often in these full-class discussions. As already reported, no higher level Initiation elicitations were issued to the LEP students, while 64% of all Teacher C's Initiation elicitations to EP students were higher cognitive level. Consider the following samples.

T-EP elicitations in full-class discussions

If you have any part of that report, do you have it now?
Can you tell me what part of the flower the pod came from?
What is it you're going to do as you go back to your table?
How many questions do you have to ask for each entry?
In a class discussion about dominant and recessive genes:
Give an example in science when a hybrid was created. (H)
If I cross a red-stemmed, which is dominant, with a green stemmed, which is recessive, what am I going to get? (H)
How many are going to be red-stemmed? (H)
According to these numbers what's the dominant trait for earlobes? (H)
What would you say is dominant with tongue rolling, people who can or cannot? (H)
In terms of handedness, what's dominant? (H)
Providing an example on how to set up portfolios to analyze one's own performances:
Where do you think this belongs - something about a transcript? (H)
Where does this go? (H)
Look at your sheet and figure out what you do with this? (H)
What is this evidence of? (H)
Why do we put this in a portfolio? (H)
Which one of these skills is this for? (H)

T-LEP elicitations in full-class discussions

Did you get this from Pat?
Do you have this reading?

Both of the elicitations to LEP students deal with what is traditionally considered management issues more than content. In full class discussion, no genuine content questions, high or low cognitive level, were issued to LEP students.

Interestingly, over half of the sample questions in the T-EP group (4 in the session on dominant/recessive genes, and 4 in the portfolio session) were actually issued by the teacher to the class as a whole. It was because EP students responded to these questions that they were categorized as T-EP questions. Teacher C's instructional style was to issue questions to the group, allowing the students to self-select by speaking out. Either the loudest or the one with the correct answer would be acknowledged by the instructor as the holder of the turn. This type of self-selection is not conducive to LEP student interaction; LEP students tend to avoid calling out answers in competition with other EP voices.

As I did with each of the groups of LEP students, in post-taping interviews I asked the students higher-level cognitive questions to see how capable they were in responding to such questions. First I asked them what they had learned from observing their fast plants. From their answers it appeared that they were able to report very little specific information about the plants. Rather, they entered into long narratives about their homes and how, in Haiti, plants are used for medicinal purposes.[1] The same narrative type of answers occurred when I asked them to explain about dominant and recessive genes, but this time their answers indicated an understanding of the

[1] Such narratives are characteristic of Haitian children's discourse as reported by C. Ballenger, analyst of Haitian classroom discourse (personal conversation, May, 1994).

concepts. Mariette told me a story about her grandparents and their grandparents and how the genes were passed on. Julien told me a story of two brown-eyed parents who had produced a green eyed-child.

At this point all three students began talking at once, wondering aloud about questions that they had. Djinane asked, "How can flowers have eggs?" and "What makes the seeds?" and "Does a plant have a vagina?" Mariette asked, "Why do animals go through so much changes? Like the millworms, they can't keep their skin; they lose their skin." And Julien asked, "How come the trees grow like branches and then more branches?" and "How come there are different kinds of flowers – like apples and oranges?" and "How come trees can grow 50 feet high and bushes can only grow 2 feet or 3 feet?', and finally, "How come trees grow - their skin is so hard?"

The level of inquiry and curiosity expressed by these three children suggested to me that they were ready to talk about science at a higher cognitive level and in a more extended fashion than they currently were doing in class. On the other hand, the narrative style these students used to answer open-ended questions might be seen as a valid reason for a teacher to avoid asking such questions of them in a full-class discussion. When a teacher asks a question, s/he does not want to receive a long narrative that hints of the answer.

The third way this study measured teacher interest in student's thoughts was to analyze the distribution of Follow-up acts (i.e., reactions to students' answers) and Response acts (i.e., reactions to students' questions). As Table 7.10 shows, no differences were found in the distribution of Teacher C's Follow-up acts. However, Table 7.11 indicates that Teacher C issued

Teacher A	EP	LEP
F: accept	43	16
F: evaluate	10	4
F: comment	206	77
F: prompt	3	-
F: check	7	1
F: directive	43	16
F: cue	-	-
F: elicitation	18	8
Totals	330	122

Table 7.10: Differentiation in use of Follow-up acts

Teacher C	EP	LEP
R: reply	294	53
R: prompt	-	-
R: check	2	4
R: directive	27	17
R: 0	1	1
R: elicitation	16	4
Totals	340	79

Table 7.11: Differentiation in use of Response acts

proportionately a greater number of reply acts (R:rep) to EP students than to LEP students ($\chi^2 = 15.59$, $p = .0001$). Again, this difference is a function of Teacher C's style of allowing the students to self-select for the floor. EP students were constantly speaking out with questions and Teacher C replied

to these questions often with extended answers – thus, the high proportion of R:rep acts.

The other significant difference in Response acts is the disproportionately high use of directives to action in response to LEP students' questions as compared to EP students' questions ($\chi^2 = 11.17$, $p = .0008$). Recall that Teacher C used elicitations in response to students' questions nondifferentially (Table 7.8, see "R:el"). Therefore, we can conclude that while EP students were asking Teacher C questions, she was responding most often with answers. In contrast, when LEP students were asking her questions, she was responding more often with directives to action. This disproportionately greater use of directives to action in response to LEP students' questions was also a tendency for Teacher B (and simply was not a consideration for Teacher A, as his LEP students did not ask many questions.)

The distribution of display and referential questions is the next indicator of teacher interest in students' thoughts and in students, themselves. Table 7.12 indicates that, like Teacher B, Teacher C asked more referential questions of the LEP students than of the EP students ($\chi^2 = 13.15$, $p = .0003$). Like Teacher B, this appears to be a function of the attention given to the LEP students in the small group/individual lab-type events, during which the teacher is asking questions about what the student is doing, what the student has accomplished, does the student need direction, etc. – the answers to which the teacher does not know. I should point out, however, that this type of lab-based answer-unknown question was about procedure more often than it was about content. Asking a student unknown procedural questions such as "Whose paper is this?", "Did you see the grade I gave you

Teacher C Class event	EP		LEP	
	U	K	U	K
T-G	5	37	4	0
T-SG, LAB	38	15	25	6
Total:	43	52	29	6

Table 7.12: Use of referential (unknown -U) and display (known-K) questions
Event: T-G = teacher-fronted discussion; T-SG = small group work

for your last paper?", and "When you get your plant tell me what color the stem is," defines a students' role in the class in a different manner than if the unknown questions were content questions like "What color do you think the stem will be?", or "How did you determine the weight of that?" All of these questions attend to the student as a person and hence, ratify the student as a presence in the classroom. But the former define the student as one who needs procedural guidance; the latter define the student as one whose thoughts are of interest to the teacher.

Finally, for Teacher C no personal detail was used. Nor did Teacher C use non-recognition of a student's question when the student had the floor (R:0).

Two students - one entity

The final point to be made in this analysis of Teacher C's talk is that most often when the teacher spoke to Mariette, she would also speak to Djinane at the same time, almost as if they were one entity. The reason

behind this was apparent; such utilization of time was efficient, the two girls worked together and if they were absent (as on the field trip) they needed "catch up" information together. On the other hand there were very strong reasons not to talk to these two girls as one entity. Mariette had been a class leader in the bilingual science program; she had clearly defined college goals. Djinane, the other hand, was boisterous, and not nearly as serious nor as attentive as Mariette. In our interview together, Djinane had proudly boasted of earning a 0 on her last test. When Teacher C spoke with the two girls, it was most often Djinane who would first respond. Consequently the subsequent interaction would be one between the teacher and Djinane, and the content would be kept at a lower cognitive level than would be challenging to Mariette. Following is an example of such an interaction. Students were working on their own, organizing yesterday's homework about dominant and recessive genes. Those students who had not been in class had been told to copy down certain numbers, charted frequency counts, from other student's notebooks. Teacher C was walking about the room checking on students.

	T	((walking over to LEP girls at table 2))
1		OK how you doing with those pages?
2	Dj	I don't have the numbers
3		I don't know what numbers
4	T	What do you mean, what numbers?
5	Dj	Yeah, you say that we have to get the numbers
6	T	uhm, Peter, ((Peter works at same table as two LEP girls))
7		((originally intending to talk to Peter about the numbers but now distracted, T talks to Peter about another issue.))

8		((back to another student, looks at his notebook and has a discussion))
9		((T walks off to table 5 and asks if all is ok))
10	T	((to table 4 and has a short conversation about a forgotten notebook))
11		((to table 3; another discussion))
12		((back to the LEP girls))
13	T	All right, how're we doing?
14	M	(-----)
15	T	Now listen,
16		what you should do is
17	Dj	Do you have the (-----)
18	T	Here, Peter's got it
19		Peter's got the numbers that are on those charts
20	Dj	I don't have it
21	T	You need to get those numbers
22		I just gave you this
23		Here it is
24	Dj	Oh
25	T	Let me see
26		Listen Djinane, there's one more page to this
27		Here it is
28		Cut it in half ((T cuts paper in half))
29	Dj	(I want to put the questions in)
30	T	That's what we're going to do
31		We're almost there.
32		This goes here.
33		Oh, you're getting the glue all over it
34		And this goes here
35		This goes here and here
36		And then, that'll be a different page, then
37		All right? ((walks away))
		((note: Mariette is getting the numbers from Peter))

Lines 7-12 are good examples of this typically polyphasic conversational style of Teacher C's. She would leave a conversation in mid-topic, often mid-sentence and return several minutes later after involving herself in several other interactions. Interestingly, I found few times in the T-SG talk where a fractured conversation was left unfinished (unlike the T-G discussions where oftentimes a topic was abandoned midstream). This teacher had a remarkable propensity for keeping multiple layers of attention open and operative. But notice in line 13, when Teacher returns to the LEP girls, Mariette attempts to say something, which is undecipherable to the observer. Whether or not the teacher understands Mariette is unclear, because she responds to the student with a directive, as is often her response pattern to EP and LEP students, but even more often with the LEP students. Then in line 17, Djinane takes the floor with a question and the teacher-student interaction which ensues is an interaction with Djinane. This pattern was typical between the teacher and these two girls. Notice at the end of the text that it is Mariette who is collecting the frequency counts. This pattern too was typical for the two girls. Thus the serious LEP student exercises less opportunity to interact, selecting instead a more quiet approach to responsively getting work accomplished in the midst of a lot of ongoing classroom talk. This pattern is similar to that practiced by Pei with Teacher B . I should point out that in my post-taping interviews with these LEP students, Mariette mentioned to me that she wished she were called on in class more often, particularly for turns to read, although the idea frightened her somewhat.

To summarize the findings with regards to positive face needs, Teacher C issued 0 scaffolding elicitations to LEP students during full-class discussion;

but in contrast issued twice as many scaffolding elicitations to LEP students in the small group lab events. No differentiation was found in the cognitive levels of scaffolding elicitations or in the distribution of Follow-up acts. In Response moves, more directives were issued to LEP students and more replies were issued to EP students. Finally, more referential questions were issued to LEP students; again this was due to the lab events and the questions were primarily procedural.

Chapter 8. DISCUSSION

Summary of findings

Table 8.1 displays a summary of the modifications found in teacher talk to LEP students by each of the three teachers. Calculations of the mean length of turns for students determined that elicitations and directives created varying speech opportunities. Elicitations resulted in greater speech opportunities than directives for both LEP and NS students. From Table 8.1 we can determine that the frequency of LEP students' opportunities to speak based on the issuance of directives vs. elicitations varied among the three teachers. Differentiation in the proportionate distribution of elicitations and directives in Initiation-only moves (#2) and overall moves (#3) would suggest that NS students received more elicitations than LEP students. However, the relative frequency counts alter these results. With regards to relative frequency, Teacher A issued elicitations to the two groups proportionately; Teacher B issued more elicitations to NS students; and Teacher C issued more elicitations to LEP students.

The differentiation in LEP opportunities to speak varied not only across the three teachers, but also for individual teachers, dependent on participant structures (#4, 5). For Teachers B and C in full class discussions, LEP students received fewer elicitations than did NS students. In contrast, in all but one lab setting, LEP students received more elicitations than NS students.

The differential distribution of directives did not vary, however; in overall speech (#3) all three teachers issued more directives to LEP students

Table 8.1: MODIFICATIONS IN NS TEACHER TALK TO EP STUDENTS AND LEP STUDENTS

Modifications	Teacher A	Teacher B	Teacher C
1. Distribution of Initiation, Follow-up, Response Acts	No difference	No difference	*** more I/S to LEP
2. Distribution of Initiation acts el = elicitations d = directives to action ch = checks	*** more I:els to EP ! more I:ds to LEP ! more I:chs to LEP (in frequency, I:els are proportionate)	! low I:els in half of talk to LEP No claim: due to low expected cell frequencies in LEP talk. (in frequency, more I:els to EP)	*** more I:els to EP *** more I:ds to LEP (diff. in proportionate distribution only; in frequency, proportionately more I:els to LEP than EP)
3. Distribution of all directives and elicitations	*** more ds to LEP *** more els to EP (slight)	** more ds to LEP ** more els to EP (slight)	* more ds to LEP
4. Distribution of all elicitations according to participant structures	N/A	*** more els to EP (low-0 els to LEP in some speech events)	** more els to EP in T-G ** more els to LEP in T-P
5. Distribution of scaffolding elicitations	No difference overall; ! more S:el to EP in lab setting	* more els to LEP (due primarily to one participant structure, one particular lab setting)	No difference in proportionate distribution. (re: frequency - in full class, 0 els to LEP; in lab, more els to LEP)

! = trend; * = significance of p<.05; ** = significance of p<.01; *** = significance of p<.001

MODIFICATIONS OF NS TEACHER TALK (Table 8.1 continued)

Modifications	Teacher A	Teacher B	Teacher C
6. Frequency of Follow-up acts	! more F:directives to LEP ! more F:evaluatives to LEP ! more F:comments to EP	*** more F:directives to LEP ** more F:comments to EP	No difference
7. Frequency of Response acts	No claim	! more R:d to LEP	*** more R:rep to EP *** more R:d to LEP
8. Cognitive levels of all elicitations	*** more High to EP	No difference (few High used throughout)	*** more High to EP
9. Cognitive levels of Initiation elicitations	! more High to EP No claim: 0 High to LEP	! more High to EP (0 High to LEP)	*** more High to EP (0 High to LEP)
10. Cognitive levels in scaffolding elicitations	*** more overall High els to EP ! more High S:els to EP ** more High F:els to EP	No difference	No difference (0 elicitations to LEP in full class structure)

! = trend; * = significance of p<.05; ** = significance of p<.01; *** = significance of p<.001

MODIFICATIONS OF NS TEACHER TALK (Table 8.1 continued)

Modifications	Teacher A	Teacher B	Teacher C
11. Distribution of all open/ closed elicitations	*** more Open to EP	* more Open to EP	No overall difference; more Open to EP in full class discussions.
12. Distribution of open/closed Initiation elicitations	! more Open to EP	* more Open to EP	No overall difference; more Open to EP in full class discussions.
13. Distribution of referential (U)/ display (K) elicitations in all moves	No Difference	* more U to LEP (due to lab setting)	*** more U to LEP (due to lab setting)
14. Transactional turns; how allotted and ratio of frequency	* more volunteered by EP * more designated to LEP EP : LEP - 1 : 1	! more volunteered by EP EP : LEP - 1.5 : 1	** more designated to LEP EP : LEP - 1 : 2

! = trend; * = significance of p<.05; ** = significance of p<.01; *** = significance of p<.001

than to NS students. In Follow-up acts (#6) and Response acts (#7), again the teachers issued proportionately more directives to LEP students.

Regarding the use of higher cognitive level questions, Teachers A and C issued overall (#8) proportionately more high cognitive level questions to the NS students. Teacher B used high cognitive level questions infrequently with both NS and LEP students. For Initiation acts only (#9), all three teachers were shown to deliver more high cognitive level questions to the NS students, this differentiation ranging from a trend to significance. Overall differentiation of cognitive levels was not found in the scaffolding elicitations (#10), where fewer high level questions were issued. However, for Teacher A, who used frequent high level questioning in his scaffolding acts, the differential distribution was found, with the greater frequency of high level questions issued to NS students.

In addition, all three teachers issued proportionately more open-ended questions to the NS students than the LEP students (#11, 12); this differentiation ranged from a trend for Teacher C to significance for Teachers A and B. Another finding for Teachers B and C was the differential use of referential (answer - unknown) questions (#13) – with proportionately more being issued to the LEP students; this was found particularly in the small group/ lab events where the questions were procedural.

Finally, regarding the number of opportunities for students to take part in a transaction (#14), all three teachers varied in accordance with their use of Initiation elicitations. The EP : LEP ratio of transaction opportunities for each teacher follows: Teacher A – 1 : 1; Teacher B – 1.5 : 1; Teacher C – 1 : 2. However, consistent patterns with regards to how turns were allocated were

found. EP students gained access to the floor proportionately more often by self-selecting and bidding for the floor, and LEP students were designated or assigned the floor without volunteering proportionately more often.

In short, the LEP students were given directives to action more often, were asked fewer high cognitive level questions, and were asked fewer open-ended questions. In full class discussions, LEP students received fewer elicitations. LEP students gained access to a transactional turn by volunteering for the floor less frequently than the EP students. On the other hand, LEP students were assigned/designated to take a turn proportionately more frequently than their EP counterparts and received more unknown questions, particularly in lab environments.

Returning to the research questions, the above findings would suggest:

1) The LEP students' opportunities to talk as frequently as EP students varied with each teacher. This variation was highly dependent on participant structures; in small group lab settings LEP students received increased opportunities to talk; in full class discussions the opportunities were restricted. Furthermore, with regards to use of higher cognitive level questions and open-ended questions, LEP students' overall opportunities to talk purposefully were more limited than those available to their EP classmates.

2) There is less evidence in the findings to suggest that the LEP students' positive face needs, those needs to be ratified, understood, approved of, liked or admired, were not met (at least, as defined by this study). The teachers' scaffolding responses to the students' talk remained relatively undifferentiated. Furthermore, through referential questioning, the teachers

attended to the real procedural needs of the LEP students, particularly during the labs. Although the LEP students' positive face needs, as defined by this study, appeared unthreatened, because their opportunities to speak as purposefully as their EP classmates were restricted, one might consider that their negative face needs, those needs to proceed unimpeded, were not met.

Explanations for these findings other than limited language proficiency

Convincing evidence exists to suggest that native English speaking content teachers do modify their discourse strategies when interacting with limited English proficient students. However, there may be explanations for these modifications other than the language proficiency of the students. In the following section four explanations other than language competency are considered. The first two explanations to be considered are with regards to the research design; the third and fourth explanations are with regards to aspects of the student population other than language proficiency.

Explanation 1: The observer's paradox may be in effect; that is, the teachers altered their behavior because of the observer's presence.

The teachers were aware that my research focused on teacher interaction with LEP students. If the findings are distorted because of this paradox, one would expect increased interaction with LEP students in the presence of an observer. If the observer's paradox was in effect and teachers were increasing interaction with the LEP students, we have to acknowledge that the findings indicate restricted use with LEP students. Hence, if the observer had not been present, the findings would indicate less interaction. Consequently, this explanation can be rejected.

Explanation 2: Due to the small number of LEP students, extraneous explanations for making students unavailable for interaction would skew the results, particularly in regards to the LEP claims.

Three extraneous explanations come to mind which might appropriately alter the teachers' discourse with the LEP students, hence, skewing the results: student absence, student shyness, and special learning considerations. With regards to student absence, during my observations, only once was an LEP student absent. This was the day during Teacher B's observations that the exceptionally interactive lab about mineral identification occurred and Hoa was absent. The differentiation in interactive opportunities for EP and LEP students that day was described in detail in Chapter 6, pp. 129-132. Had Hoa been there, and had he interacted extensively with Teacher B that day, the results would still indicate that 100% of all EP students experienced extended interactions, while only 33% of the LEP students (i.e. Hoa) would have experienced the same level of interaction, and the claim of limited interaction opportunities for LEP students would remain the same. Consequently, explanations with regards to LEP student absence can be rejected.

Regarding student shyness, the explanation might be that some students are naturally shy and choose not to be interactive in the classroom. Teachers who understand and appreciate different learning styles will be responsive to this difference. With so small a number of LEP students, if teachers are responding to particular LEP students' shyness, the resulting appropriate avoidance could seriously skew the results. To consider this explanation one must consider the overall distribution of student-teacher

interactions; i.e., did the teachers interact overall with certain students more than with others and did this pattern differ in talk to EP and LEP students? For EP students, the distribution for each teacher was quite typical. A small percentage of students remained relatively quiet. Certain high achievers (as reported by the teachers) were verbally active and average-good students participated in a range from frequently to infrequently. Similar distributions occurred for the LEP students. For Teacher A, one of the eight Russian speaking girls was unusually verbally assertive; three more were considerably verbal; the remaining four remained relatively quiet. For Teacher B, Hoa and Cui were more verbal; while Pei remained quiet. For Teacher C, all three of the LEP students were quite verbal as were most of the EP students. Thus, with regards to student shyness and any consequential appropriate teacher response to this shyness, the EP and LEP groups appear to be similarly distributed. Hence, this explanation can be rejected.

With regards to special learning considerations, the explanation would be that a teacher would appropriately respond to this student in a manner different than to his/her other students in the class. Should an LEP student have special learning needs, given the small number of LEP students, the appropriate teacher response to this student could significantly skew the results, particularly the results of higher cognitive level elicitations.

Teacher B was the only teacher who had an LEP student who she suspected had a learning disability. Yet it was with this particular student, that Teacher B exhibited the model strategy of first issuing low level, closed questions followed by a second high level, open-ended question. Therefore, skewed results indicating a drop in high cognitive questions because of this

particular student did not occur. Consequently, with regards to special learning considerations, this explanation can be rejected.

Explanation 3: The teachers were reacting in a prejudicial manner to the cultural differences of the LEP students; i.e., they were acting out of prejudicial biases.

All three teachers were chosen because of their cultural sensitivity with students. Two of the teachers (A and C) were part of a voluntary research and training program on how to increase student involvement in the class (a program proven to be particularly helpful to bilingual students); the third (B) was designated by her department chair as the teacher most capable and interested in working with the linguistic minority students. Consequently, this explanation is rejected.

Explanation 4: With regards to students' cognitive abilities, the teachers were responding appropriately to each individual student's level of academic development.

Based on the findings of limited high cognitive questions issued to LEP students, this explanation would imply that the LEP students' academic abilities were overall less developed than the EP students. To respond to this explanation, the cognitive abilities must be discussed at two levels: a) the students' capabilities as demonstrated by the students; and b) the students' capabilities as perceived by the teachers.

In response to the first proposition, four of Teacher A's LEP students (50%) were high academic achievers as reported by the bilingual teacher; two of them were on the honor roll. Teacher B reported Hoa to have received good test scores regularly; in her words, he exhibited "strong recall skills."

Also, one of Teacher C's LEP students, Mariette, had been a leader and academic achiever in the bilingual science class. If exhibited capabilities dictated teacher's frequency and cognitive levels of questions, one would expect a relative difference in questioning patterns issued to Mariette, a science class achiever, and Djinane, a student who earns poor test scores. This difference was not found. Furthermore, the percentages of academic achievers in the LEP populations easily mirror, if not surpass, the percentages of academic achievers in the EP populations. Consequently demonstrated skills can not account for the limited numbers of cognitive questions issued to LEP students.

With regards to the students' academic abilities as perceived by the teachers, Teacher A was aware of the capabilities of his four LEP academic achievers as evidenced by their earned grades in his class. Teacher C had worked with Mariette in the bilingual science class, as a weekly visiting science specialist; she had seen Mariette excel in the bilingual environment. Although Teacher B had taught Pei in another non-college preparatory science course, the environment of required science courses for "tracked" non-college preparatory students is such that serious scientific inquiry does not occur, nor does a teacher have the opportunity to assess individual skill potential in a class which requires so much attention to discipline issues. During our interviews, her comments were vague regarding the students' science skill levels. Consequently, she may have had insufficient assessments of the skills of her students, and may have perceived the skill levels of her LEP students to be lower than they actually were. Without further evidence we cannot determine this.

Therefore, perceived cognitive skills would not be a reason for Teachers A and C to have modified their discourse styles as they did, but may be an explanation for Teacher B. Because the modifications found in cognitive levels of questioning were similar particularly for Teachers A and C, it is reasonable to assume that other explanations exist for the findings.

We now turn to explanations with regards to the students' limited language proficiency.

Explanations for the modifications regarding language proficiency

The modifications found which facilitated LEP interaction were intentionally produced by the teachers. All three teachers purposely made good use of small group lab time to interact with their LEP students. Teacher B knew that she was asking Cui questions in a pattern that allowed her first to answer an easy question and then be challenged by a more difficult one. She reported, "I wanted to give her one she could answer. She had a 50/50 chance of getting it right. But then I wanted to see if she really understood what she was talking about." Teacher A called on the LEP students each time one raised her hand; moreover all three teachers called on LEP students who had not bid for the floor more frequently than EP students. These are simple solutions to a problem of limited interaction, but in their simplicity they are also most effective and important.

On the contrary, those modifications found which limited LEP interaction were produced unwittingly; this was confirmed through the post-taping interviews of the teachers. As salient as these modifications appear to be when viewing the quantitative findings or analyzing particularly chosen

sections of text, this differential treatment was actually quite subtle. Even in my observations, as I watched for modifications while taping, oftentimes, I left a school thinking that I had observed undifferentiated behavior. Therefore, the differential use of questions, directives, higher cognitive questions, open-ended questions, and referential questions is occurring subtly and unintentionally. Following are four possible explanations for why these modifications occur.

Perceived levels of language competency

Explanation 5: With regards to language proficiency, teachers are addressing individual pupils appropriately according to each student's own level of language competency.

This explanation needs to be considered at three levels: a) the student's demonstrated language ability, b) varying language competencies determined by varying contexts, and c) the student's ability as perceived by the teacher. Regarding the demonstrated abilities, in the post-taping interviews four of Teacher A's LEP students exhibited the ability to discuss academic concepts in extended sentences (Chapter 5, p. 97). Repair work was required to ensure understanding. At times we needed to refer to visual aids, such as a diagram to help explain water displacement concepts. I would point out, however, that these conversation strategies: asking the student to repeat or clarify, issuing confirmation checks, and referring to visual aids, were all common strategies used by Teacher A in class discussions with EP students, who (as junior high students often do) swallowed their words, spoke too quickly and/or too softly, and experienced difficulties when trying to convey abstract ideas.

From Teacher B's class, both Hoa and Pei exhibited the language competence to discuss concepts in extended sentences. (I did not interview Cui.) Hoa was less willing to discuss academic concepts. Pei indicated interest in expressing extended thoughts, but needed considerable negotiation by the listener to render his utterances understandable (Chapter 6, p. 122). To further develop his skills in expressing extended, abstract thoughts he would need more speaking opportunities than his non-college preparatory class will provide.

Similarly, during post-taping interviews two of Teacher C's students exhibited the capability to discuss their thoughts in extended spoken English. They had been in the English-medium science classroom for only a few weeks, however. Therefore, they had not yet learned the appropriate conventions for answering high cognitive level, open-ended questions. Rather, they answered such questions with personal narrative stories (Chapter 7, p. 173). I suspect they would need more time in the English speaking academic setting before identifying and utilizing appropriate academic response styles. For this reason, one might expect Teacher C to avoid questioning the LEP students in class. However, in our interviews, she reported to me how much she enjoyed the bilingual science classes because of the involvement of the students; she wished that her EP students weren't so reluctant to actively engage in discussion. Therefore, it is reasonable to suspect that she was not avoiding asking high cognitive level or open-ended questions for this reason.

To summarize the student's demonstrated ability, LEP students of all three teachers indicated language capabilities sufficient to engage in extended,

academic discourse; some exhibited more skill than others. However, they demonstrated this ability in post-taping interviews, not in the classroom. This brings us to the second point of this explanation – that language competencies vary dependent upon contexts.

The LEP students exhibited their proficiency to produce extended science talk within the safety of one-to-one discussions with the interviewer, who is experienced in negotiating and scaffolding speech with LEP students. It is unrealistic to expect that the competency required to speak in such a nurturing environment can be equated to the competency required to speak in a full class discussion in the presence of a teacher who is responsible for determining whether answers are right or wrong and who is ultimately responsible for assigning class grades. However, the ability exhibited in the safe context is a good indicator of a learner's production potential. With proper training and consequential awareness of language development, a content teacher can learn to create similar "safe" contexts to assess the language proficiency of his/her LEP students and to provide initial opportunities for their extended, purposeful speech production.

The final point regarding students' language ability is perhaps one of the fundamental explanations for the teachers' limited interactions with LEP students; that is, the teachers' perception of students' language abilities. Due to the context specificity of language competency, the classroom context may cause the teachers to misanalyze and underestimate the students' real language competencies. The three content teachers had not been trained in second language development. They had not been introduced to methods of assessing the verbal abilities of LEP students. Content teachers, unaware of

second language development, may underestimate LEP students' abilities to produce extended utterances. Hence, they may call on the LEP students less frequently and with fewer open-ended elicitations.

Furthermore, without an understanding of NS-NNS repair work required to achieve comprehension, content teachers may not recognize how similar the process of NS-NNS repair work is to the process of NS-NS repair work, which already occurs in their classroom discussion (as mentioned earlier in this section). Finally, content teachers, unaware of second language development, may confuse language skill and academic skill; consequently, they may incorrectly underestimate an LEP student's academic abilities, based on their perception of the student's communicative competence.

Herein lies the problem for LEP students. If a teacher misjudges the language competency of an LEP student, the teacher may call on the student less often and/or for less rigorous questions. The student has less opportunities to practice and to develop his/her language competency.

To summarize, although actual language proficiency may not be a satisfactory explanation for the observed differentiation, context specificity of language competency and, consequently, the students' language competencies as perceived by the teachers may be strong explanations.

Time constraints

Explanation 6: Teachers cannot afford the time required to frequently interact with LEP students; such interactions take too long. At the same time these teachers have twenty other students in the class needing attention and a predetermined curriculum which needs to be covered.

Time is a legitimate concern and has been discussed in the literature. Tobin & Gallagher (1987) interviewed teachers who claimed they knew that they taxed the LEP students to a lesser extent and relied on student leaders in the class to model good answers, to provide sufficient stimulus in the classroom, and to assure that sufficient content was covered in allotted time frames. Pica (1987) pointed out how the uneven distribution of teacher and student talk (with so much more talk belonging to the teacher) allows instruction to proceed as planned. "If teachers took the time with each student for individual negotiations aimed at mutual comprehension of message meaning, the result would be that very few topics could be covered, and not all students could take turns at displaying their knowledge" (p. 11). In my interviews with all three teachers, references to time and the pressures to cover sufficient curricular material were frequently made. Consequently time constraints are a real explanation for avoiding extended talk with LEP students. However, the assumptions about the time needed to more fully interact with LEP students will be discussed later in this chapter in the "Recommended strategies" section.

Two other issues of time might also be proposed as explanations for the modifications found. One is a rhythmic issue. A certain pace of action and classroom talk is maintained by the teacher. This pace ensures sufficient coverage of material and is meant to capture the interest of all students. The pace is also determined by our unconscious cultural speech settings. For example, after a question, teachers have a range of wait time that is acceptable. This range rarely extends beyond three seconds, after which the wait begins to feel uncomfortable to the teacher, at which point, the teacher frequently

supplies the answer, adds a clue, or calls on another student. Given this internal clock, teachers do not allow the LEP student the time needed to express an extended thought, and after a few such awkward interactions (awkward for the teacher's internal clock, not necessarily for the LEP student), teachers become trained to avoid such potentially time-consuming interactions. This awkwardness is not only due to an internal clock. As previously noted, the teacher is also aware of the other students in the classroom and their needs to stay involved.

A third issue of time is speculative on my part. Just as there is an internal culturally based interaction rhythm that determines appropriate wait time between speaker's turns, I suspect there may be similar rhythmic dictates that determine amount of talk time allowed to a given topic (related to Grice's maxim of quantity.) Hatch refers to this idea in her conversation about the use of "either/or" choice questions with LEP students:

> These kinds of repairs by the native speaker make it easier for the learner to take a turn in the conversation, since the required answer is, in effect, supplied. This places all the burden of the conversation on the native speaker who must then take up the turn again. When we can't get rid of the turn, we can end up feeling exhausted after 5 minutes of such conversation with second language learners. (Hatch, 1983, p. 177).

I suspect that after a considerable amount of repair work, the NS speaker intuitively feels as if the time on topic is nearing an end based on some internal rhythm meter; s/he may be feeling exhausted given the work required to complete a repair; and chooses to move along rather than to remain on topic to complete any original propositional intentions regarding the topic. Consider the following interaction between Teacher A and his class. The teacher is introducing Punet Squares, a four squared box with the

father's two gene types written horizontally above the box, and the mother's two gene types written vertically alongside the left side of the box. This square is used to predict the genetic makeup of offspring of a given father and mother. Example:

		X (father's genes)	Y (father's genes)
(mother's genes)	X	XX	XY
	X	XX	XY

Drawing and writing on the board the teacher says:

1	T:	Bring it across.
2		Here ((drawing))
3		and here
4		and we do the same thing here. ((at board))
5		Now look at the 4 choices in that box.
6		How many of them are male?
7		Greg?
8	G:	2
9	T:	Two,
10		two of them are male. ((circling the male boxes on the board)).
11		How many of them are female? ((Nods to Alice))
12	A:	2
13	T:	Two of them are female.
14		What is the percentage of males?
15		Mike?
16	M:	50?
17	T:	50% male.
18		What's another way of saying that?
19		Liana
20	L:	a half
21	T:	One half are males.
22		What's another way of saying that?
23		Alice
24	A:	point 5

25 T: point 5.
26 What's another way of saying that?

27 S: half are female?

28 T: Half are female.
29 What else?

30 S: Uhm, 5 percent

31 T: No,
32 it's not 5 percent,
33 it's 50 percent.
((sees the LEP student, Lara's hand raised)) yes?

34 L: one second?

35 T: One second?

36 Ss: huh? what?

37 S: One over two.

38 T: One over - one over two,
((pointing to two of the four boxes)) but there's two in here. ((looking to whole class))

39 S: two out of four

40 S: (-------)

41 T: of the whole.
42 Two ((writes down on the board 2/))

43 ESL/T: Like a fraction, is what she meant, like a fraction
44 T: ((completes the fraction 2/4 on board)) like a fraction,
45 so ((writing 1/2 next to 2/4 on board))like that,
46 one half

47 ESL/T: one half

48 S: two fourths
49 T: one half,
50 one sec- ,
51 yeah,
52 I see what you mean,
53 I was thinking time.
54 So one second, or one half or two fourths, or 50%.
55 T: This means that every time two people have an egg and a sperm meet, there's a fifty percent chance that you'll

get an X and a Y and a 50% chance that you'll get an X and an X.

56 So every time somebody has a baby there's a fifty percent chance that it's going to be a male and a 50% chance that it's going to be a female.

When Teacher A did not understand Lara's answer in line 34, a repair work strategy that includes the other students in the class and the ESL support teacher continues through line 51. What has preceded Lara's utterance was a fast-paced, highly rhythmic student-teacher interaction pattern of teacher asking for "another way", student issuing a short answer response, teacher echoing the student response and beginning the routine again by asking for "another way". Notice how after the extended repair work, whatever additional answer Teacher A was originally looking for, he relinquishes all need to continue the search for "another way of saying it" and proceeds to draw closure to the routine by issuing summary metastatements. It would seem that the repair process exhausted Teacher's time on this topic.

Another consideration as to why topics often reach quick closure after such repair episodes is that as a NS reaches resolution on a piece of repair work, there is this sense of completion - but it is a false sense, in that only the repair work has been accomplished; the original propositional intent remains unfinished.

Concern to shelter LEP students from embarrassment

Explanation 7: Teachers want to spare the LEP students any unnecessary embarrassment.

Frequently, the teachers spoke about this concern; that NS students at that age can be cruel in their fun making; that the LEP students may be embarrassed if asked to answer a question and they make a grammar error. In

Teacher A's words, "I find that the kids are very intolerant. They're not interested in the ESL kids' thoughts. That makes the kids feel horrible. I try to model behavior and I punish those behaviors that I don't want." The LEP students, too, spoke about the embarrassment they experienced when saying something "in bad English".

But it was clear to me in my observations that when a misunderstanding based on English errors occurred, the embarrassment, or the awkwardness, was felt equally by the teachers. Perhaps the awkwardness shown by the teachers was actually a sympathetic experience of the student's embarrassment. Or the teachers' awkwardness might be indicative of a lack of understanding of a second language development model which forecasts errors will be made as new language is practiced in the real speech environment.

In any event, the teachers' attempts to mitigate any embarrassment felt by the LEP students – by filling in their answers, by refraining from asking difficult questions, by doing for the student rather than allowing the student to do – ultimately reduced the role the LEP students could take in the classroom. As mentioned in Chapter 5, Hatch (1992) referred to some of these modifications as a benevolent conspiracy.

> Teachers may "fill in the blanks" when learners search for words or expressions. In a helpful conspiracy, they may offer hints and finally even answer their own questions to make the communication easier for the learner. This lightens the burden on the learner, and it also supplies a good deal of incidental instruction. (Hatch, 1992, p. 23)

Yet there is reason to expect that if LEP students have been mainstreamed, they would be beyond the need for such benevolent mitigation. How can a

content teacher, untrained in second language development, assess when an LEP student is ready to be further verbally challenged? This will be discussed in detail in the section entitled "Recommended strategies."

LEP students don't understand

Explanation 8: Often when teachers try to talk with LEP students, it appeared as if the students were lost; teachers could not take the time it would require to get the LEP students back on topic.

Given the amount of personal attention needed for procedural review in the lab events for LEP students, it was evident to the teachers that the LEP students often did not understand fully what was going on. Teacher A reported this as his greatest concern, "I don't know how to determine what they understand and what they are not getting."

This is a legitimate concern for content teachers, unfamiliar with stages of L2 development. They are unaware how much time LEP students need to adjust to the flow of constant, rapid English content. Strategies exist to help the LEP students during this process, such as pairing them with an EP student or providing more written framing. However, until the time that content teachers are trained in such strategies, their concern that their LEP students may be lost, and their consequential avoidance of asking frequent or difficult questions of the LEP students is to be expected.

Summary of explanations

In summary, teachers may unintentionally be modifying their discourse strategies in ways that limit LEP student interaction for the following reasons: a) a perception that the students' language abilities are more limited than they actually are; b) time constraints in the classroom and

internal rhythm constraints; c) the need to shelter LEP students from embarrassment; and d) the LEP students' exhibited difficulty understanding what's going on in the classroom.

Consequences of these findings

Before discussing the consequences of these findings, I would remind the reader of the tripartite nature of the classroom curriculum, that social and communicative strategies are developed simultaneously during the learning of the academic content. With this in mind, let us look at how NS modifications which limit the LEP students' opportunities for interaction might affect the students' development of academic content, social definition, and communicative skills.

Development of academic content

As has been previously discussed, interaction allows for the co-construction of ongoing knowledge developed by the group. If a class is exploring how X and Y chromosomes combine to determine the sex of a future zygote, those who speak up shape the thinking of the group as a whole; hence, the richness of the dialogic instructional approach. Granted, some students may choose not to speak up; their learning styles or personalities may prefer silence and listening as the optimum learning modes. But if one's learning style or personality leads one to be an interactive player in the classroom, perhaps even a classroom leader, and the opportunity to play an active role in the ongoing speech event is reduced, then one's opportunities to learn and to participate in the co-constructed classroom knowledge are equally diminished.

Definition of social role

Students' roles in the classroom are largely defined by their roles in interaction – how often they talk and what they talk about. Hence, we identify the class clowns, the class leaders (both social leaders and academic leaders; and these are not necessarily the same), the shy students, the disinterested soon-to-be drop-outs, the troublemakers, etc. What was striking in this study was to find class leaders in the bilingual classrooms entering the mainstreamed content classroom and assuming significantly reduced participatory roles.

The findings of this study suggest that the LEP students' opportunities to interact at higher cognitive levels and to speak as frequently and as purposefully as their classmates were restricted. In other words, their opportunities to be expressive thinkers and active role players in the classroom were diminished. Hence their socially defined roles as thinkers and class participants may have been reduced. In this situation, the LEP students may have experienced a reduction of face.[1]

Development of communicative skills

Two of McLaughlin's Twelve Guiding Principles for Enhancing Second Language Development (McLaughlin, 1994) are: "The more opportunities children have to speak, the more their language will develop," and "Language develops best when teachers and children interact in meaningful ways." Research has shown us that even in the foreign language classrooms,

1 Harder (1980) speaks of "the reduced personality of the second-language learner" but sees this phenomenon as a function of the learner's communication strategies. That is, the learner , who selects the strategy of topic avoidance, is depicted as "letting linguistic problems prevent you from performing actions you might otherwise wish to perform" (p. 267).

students experience few chances to speak, and even fewer chances to speak in extended discourse. (Swain (1988) reports that in an analysis of immersion classrooms that fewer than 14% of students' utterances are longer than a clause.) The consequences of our findings would seem obvious: the proportionately fewer questions directed to LEP students, the fewer their opportunities to answer. The proportionately fewer open-ended questions directed to LEP students, the fewer their opportunities to speak extended discourse. Table C.1 in Appendix C shows that higher cognitive level questions were most frequently open-ended questions, while lower cognitive level questions were most frequently closed questions ($\chi^2 = 106.613$, $p = .0001$). Consequently the proportionately fewer high cognitive questions directed toward LEP students also suggests that LEP students have fewer opportunities to speak in extended discourse.

The frequent use of lower cognitive questions with LEP students further means that instead of being asked to speculate, analyze, reason, and support, these students are primarily asked to recall. What, if any, are the consequences of these findings in the development of communicative skills? In my interviews with the LEP students, most were able to communicate answers to high cognitive level questions – rudimentarily, but nevertheless, able. They had the vocabulary and grammar to express what they needed to. What they could not do was express those thoughts in a variety of ways. Lemke explains the importance of this skill as he describes what it means to talk science:

> In teaching science, or any subject, we do not want students to simply parrot back the *words*. We want them to be able to construct the essential *meanings* in their own words, and in slightly different words as the situation

> may require. Fixed words are useless. Wordings must change flexibly to meet the needs of the argument, problem, use, or application of the moment. But they must express the same essential *meanings* if they are to be scientifically acceptable and, in most cases, practically useful. This is what we mean when we say we want students to "understand concepts". (Lemke, 1990, p. 91)

Such variation requires of the linguistic domain an expanded facility with the grammar and a significant increase in vocabulary with a developed understanding of the semantic relationships of words. Examples of such facility with linguistic elements which allows the student the variety necessary to express an understanding of scientific concepts are: the facility at which active sentences can be altered into passive; the ease at which cause/effect relationships can be expressed with a variety of subordinating conjunctions (because, therefore, consequently, if, then); and the numbers of ways in which synonyms such as "marine fossils" and "fish fossils" are utilized to express subtle hyponymic nuances. Lemke continues by expressing the importance of practice in the acquisition of this facility.

> With variation, it is possible for students, even unconsciously, to do intertextual comparison, to hear each expression in the context of the others. This not only leads to mastery of meanings, rather than memorization of wordings, it also gives students models of different, and so flexible, ways of constructing the thematic relations with words. Of course, just listening to the teacher do this is not enough; they need practice at doing it themselves, at putting things into "their own" or "different" words. (Lemke, 1990, p. 113)

There seems to be an understanding among language teachers that such practice is necessary. It is striking how often the words "of course" accompany the concept that practice is required to ensure facility of oral production. But what is it about practice that facilitates production? And is there a difference between practicing by answering higher level cognitive questions and practicing by answering lower level cognitive questions?

To answer this question, I refer to a framework developed by Bialystok and Ryan (1985) for analyzing how large, complex amounts of linguistic information are processed. This framework was first developed to discuss reading abilities in a second language and has recently been expanded to discuss full second language proficiency (Bialystok, 1994). While the original framework focused on reading, I believe the concept is readily transferable to the function of L2 oral production. Bialystok and Ryan proposed that our understanding of reading comprehension strategies is clarified when mapping this process onto two separate "processing components": 1) the *analysis* of linguistic knowledge and 2) the *control* of linguistic processing. The first, the analysis of linguistic knowledge, is the ability to access, analyze, and utilize linguistic information, such as the linguistic samples just listed, to include altering active sentences into passive, or expressing cause/effect relationships with a variety of conjunctions. The second processing component is the control of linguistic processing. This concept is closely related to the work in information processing, particularly regarding memory storage. This control allows the user to determine how much attention to dedicate to meaning and how much to dedicate to linguistic form. For example, when faced with linguistic complexity, such as the use of multiple negatives, a reader is required to suspend attention to meaning while attending to linguistic form, a strategy requiring high control.

According to Bialystok and Ryan, different language events require various levels of analysis and control. When reading a text that is syntactically dense and complicated, whose academic content message is equally new and difficult to grasp, the reader will have to consciously

determine when s/he can focus on meaning and when the need arises to suspend attention to meaning while attending to the linguistic aspect of the text to further elucidate the meaning. This is an example of the need for both a high level of linguistic analysis and processing control. Similarly, when answering a high cognitive level question, a student may need to produce text that is syntactically and semantically challenging, given the decontextualization demands of the question. At the same time, the cognitive challenges of the content may be demanding extraordinary attention. The speaker will have to consciously determine how much attention s/he can devote to the linguistic challenges and how much to the academic content challenges.

Consider for a moment the difficulty of expressing a new cognitively challenging thought in one's own L1. How often might a teacher hear a student commenting "I know it; I just can't explain it," or "I can't put it into words." Imagine, then the dual cognitive challenge facing the L2 student when s/he is asked a higher level cognitive question. Both processing domains - the linguistic analysis and the processing control would be highly taxed. Imagine further the challenge of producing speech that is both academically appropriate and linguistically accurate within the demands of real time.

Through extensive practice, some of the linguistic knowledge could be automatized (for example, the use of the cause and effect subordinating conjunctions). As one domain, the linguistic analysis domain, becomes less cognitively challenging, the second domain, the processing control, could be expended more easily in the analysis of the academic content. But without

sufficient oral practice the linguistic production tasks cannot be automatized. And without automatized facility in the linguistic analysis domain, the task of discussing higher cognitive level concepts could remain overwhelming for LEP students, particularly at the real time pace that classroom discourse is expected to occur.

Consider the following analogy. A driver learning to drive standard stick shift in the middle of heavy traffic needs to concentrate on the letting up of the clutch, the gear patterns, and the feel and sound of the power train revolutions to determine when and how to shift next. Imagine this driver also experiencing a very difficult, challenging argument in the car, a discussion that demands full attention. What does the driver attend to? The argument? The shifting? With enough driving practice, the shifting can become more automatized, allowing the driver to attend to the challenge of the argument. But this automatization requires practice. This practice may first require time spent away from the heavy flow of traffic in an environment that allows for longer processing time, but ultimately practice in the heavy flow of traffic is also required.

So, too, the LEP student needs 1) the repeated opportunities to practice producing extended, decontextualized, higher cognitive level talk. And until such time when the linguistic elements needed for such talk are automatized, the LEP students also need 2) an extension of time in the speech event to formulate the content thought and to formulate how to express the thought.

Without these opportunities for repeated practice in the production of extended, decontextualized, higher cognitive level talk, LEP students will not have the opportunity to automatize the more sophisticated language

elements required. Hence when faced with the dual challenge of complex thought compounded by difficult linguistic challenges, the LEP student will be unable to express him/herself with the facility of communicative skills needed to indicate an understanding of the concepts.

Summary of the consequences

In summary, NS teacher modifications which limit the interactive opportunities for LEP students may result in the following consequences: a) limited opportunities to co-construct ongoing classroom knowledge; b) reduction of face for the LEP student; and c) restricted opportunities to practice extended, decontextualized, higher cognitive level talk.

Recommended strategies

I would propose four suggestions for content teachers and educational administrators who would hope to improve the interaction environment for LEP students.

1. Train content teachers on issues of second language development, so that they may better be able to assess their LEP students' language and academic abilities and so that they might interact more facilely with students who are attempting to talk in a developing language. Harklau (1994) and van Lier (1988) both make the point that increasingly, classrooms contain at least one or two students whose primary language is other than the language of instruction. "For these learners every classroom is an L2 classroom, and unless they are left to sink or swim, every teacher in such a classroom is at least a part-time L2 teacher" (van Lier, 1988, p.7).

2. "They need to be challenged, not coddled." These are the words of Eugene Garcia, Director of the Office of Bilingual Education and Minority Languages Affairs, in his keynote address, "Goals 2000 and Beyond: the Challenge of our Culturally Diverse Students" for the June, 1994 summer institute sponsored by the National Center for Research on Cultural Diversity and Second Language Learning. Strategies that at one point assist an LEP student in L2 development can later actually stifle the further development of the L2. This is the point where NS modifications become detrimental, not beneficial. This is the point where benevolence becomes reduction of face.

But exactly when in the continuum of a developing second language is that point of diminishing returns? At what stage of language development does this benevolent modification become reduction of face? That question has not been answered definitively, and will require further research before it can be answered fully. But some practical suggestions can be given on how to assess when an LEP student may be ready to be further verbally challenged. A university LEP student defined the point at which he wanted to be verbally challenged in class as that time "when I learned to think in English." Perhaps, in his own way, he was referring to levels of automatization he had achieved. But a teacher is unable to assess in which language a student is thinking.

Teacher B provided us with one excellent strategy that can help assess an LEP student's readiness for further verbal challenge. In the "circle review" class, she first asked one LEP student a simpler, closed question, and then followed-up the student's correct short answer with a higher cognitive level,

open-ended question. This was an intentional pattern she employed with this particular LEP student.

Another means to assess readiness is by the student's written work and quizzes. In Teacher A's classes, two of his LEP students were honor roll, A students. This is a strong indication that they may be ready to be further verbally challenged.

One way of initiating the verbal challenges is to begin in small group or individual interactions - thus reducing the risk of embarrassment. Time is already being expended on the LEP students; therefore, this suggestion is not to increase the time of attention and thereby decrease time for other students. Rather, the suggestion is to slightly alter the interaction patterns during the time spent with LEP students.

However, as teachers begin to ask more challenging and open-ended questions, they will need to learn how to deal with the awkwardness of repair work. They will need to learn not to be embarrassed by students' speech errors, but to simply stay with the student and negotiate until understanding is reached. By modeling such interactive behavior, NS students can learn a new face-saving way to interact with their LEP peers.

Specific ways to become more challenging include asking more questions of the LEP students. Wait longer than the traditional wait time for their answers. Ask more high cognitive level questions and open-ended questions of the LEP students. Wait longer for their answers. Consider, also, one's style of opening the floor for students' turns, realizing that the popular method of issuing an elicitation to the group and allowing the students to self-select excludes the LEP students for the most part.

3. Become conscious of the pace of talk, and of the altered pace required for interactions with LEP students. In an attempt to provide LEP students with opportunities for more "native-like" interactions there is one modification that will be required. That is the conscious alteration of pace – wait time for LEP students to respond, wait time for LEP students to complete full utterances, and possibly expanded time on topic to account for time (and energy) required for repair work.

Specific suggestions regarding pace:

a) After asking questions to LEP students, wait longer for their responses. There may be a concern that such wait time will detract from the tempo required to maintain involvement of the entire group. If so, consider the following. Teachers traditionally wait 3 seconds after asking a question before issuing another utterance. If teachers were to double, or triple, this wait time to 6-9 seconds for LEP students, and were to practice this strategy once daily for each of 3 LEP students in a class, no more than 30 seconds of class time would have been spent. Or if a teacher were to make it clear through extended wait time early in the semester that s/he will expect an answer rather than accept a typical avoidance response such as Hoa's "I don't have a clue" or what Teacher A described as the "ESL shrug", the LEP students would soon learn that verbal interactions will be required. In this case, the extended wait time early on would be an investment for increased interaction time later in the semester.

b) After extended repair work, check one's internal "topic meter" and readjust the reading, so that the topic continues to be developed to the same length as if the repair strategy had not occurred.

4. Provide additional framing for the LEP students.

Being lost is often a consequence of insufficient framing. Research in the reading field has focused considerably on the importance of framing for effective reading comprehension. By framing a topic before reading a text, readers call up schemata about what they are soon to read. These schemata are like hooks on which the reader can then attach pieces of information; they are a frame upon which the reader can build meaning.

Similarly, LEP students when preparing to listen to a lecture can prepare to be more successful listeners by developing a framework with appropriate schemata. If content teachers were made aware of the benefits of framing a topic, they could assist the LEP students by providing a framework more frequently. Consider the following example:

In a seventh grade science class, students were giving oral presentations of their individual experiments. Students had created their own research questions, designed their own experimentation, and now, with posters as visual aids, were presenting their findings. At this point, one student was presenting her experiment about the taste of Pepsi. She stated her research question, and, given the soft voice of this seventh grader, Teacher A repeated the student's utterance for the class so that everyone could hear it, as he often did. The student then proceeded with the oral report about a blind taste test and her findings. I was standing next to one of the "leader" LEP students. It was clear to me that she was confused and could not follow the gist of the presentation. At one point she interrupted me and asked "Excuse me, can you tell me what is the question?" I wrote down on my notebook in front of her: "Does the color of Pepsi. . ." and before I could

write any more, she exclaimed "Ahhh", in acknowledgement that she now realized what about Pepsi was being discussed, what two distinct variables about Pepsi were being compared - the taste of regular Pepsi vs. clear Pepsi. This simple framing allowed this LEP student full access into the discussion. As I continued to observe this class period, I repeatedly saw how easily the LEP students could have followed the class reports, had the research questions been written on the board for them. The EP students only had to hear it from a voice loud enough to be heard; and Teacher A understood the importance of framing sufficiently to assure, by his repeating aloud each research question, that all heard the questions. What Teacher A did not realize was the difficulty of grasping content in an L2 when hearing a phrase only once, and how this grasping can be eased by also seeing the text written as one is hearing it.

This next example of how expanded use of sufficient framing could ease LEP students' confusion also comes from Teacher A. One of the ways in which this teacher framed an experiment was to have students write quietly for a few moments about what they thought would happen; in other words, each was asked to personally speculate, to come up with a hypothesis. Teacher A was also very careful to make sure important directions and important conclusions were written on the board. In my observations, LEP students strongly relied on these blackboard notes. In the following sample, Teacher A wrote on the board what he wanted the students to do. But in this case, the directions were not quite clear to the students. Notice how the clarity was created through an oral interaction between teacher and EP student.

1	T:	((then teacher to class)) Okay.
2		What I want you to do is write down on your paper - "density of styrofoam" ((writes on board)).
3		"Hypothesis." ((writes on board))
4		Now the hypothesis I want you to tell me,
5		I want you to "compare density of styrofoam and density of water" ((writes on board))
6		And today what we we'll do is measure those densities.
7		But first you're going to tell me how they will compare.
8		And tell me what makes you think that. ((silence))
9		So do that right now.
10	S:	((asks him some Q))
11	T:	You don't get it?
12	S:	Like (are we supposed to write down like ---)
		((teacher is in back of room having this conversation. with S. S's utterances are very quiet, but T's utterances, can be heard throughout the room))
13	T:	You don't have to write down numbers.
14	S:	((asks another question or indicates confusion - not clear to observer))
15	T:	What do you think I mean when I say "compare" densities?
16	S:	See which one's heavier, which one's more dense
17	T:	And how would you know that?
18		or how do you think the styrofoam might act when it is dropped in the water?
19		And why you think it might act like that.
20		So write that down now -
21		write that down now.

Notice in lines 15-21, how the teacher clarifies the expected student behavior. particularly in lines 18 and 19. All of this talk is intended by the teacher for the entire class, although initiated by one student. But the teacher is not in front of the classroom, nor are these clear instructions written on the board. But somehow, it is clearly understood by all but the LEP students that he is

issuing further clarifying instructions to the whole class. From this point on students in the class know specifically to speculate about whether or not the styrofoam will float or sink, and to provide a rationale for their hypothesis. The LEP students did not attend to this talk as if it were for the entire class; they therefore did not hear this portion of the framing. Throughout this class period, they remained confused about what exactly they were measuring, what the exact research question was.

Other teaching strategies exist to provide framing for the LEP student. One in particular is to pair each LEP student with an EP student for the explicit (or implicit) purpose of guiding the LEP student as needed. Such pairing reduces the amount of direct attention required by the teacher. However, as this study's focus is teacher input, we will discuss framing primarily from the perspective of teacher talk.

One final comment about framing, an observation from Teacher B's class. Enclosed in Appendix D is the handout used to frame the lab on chemical and physical properties of select minerals. A portion of this handout has already been viewed in Chapter 6. In this handout, the procedural instructions are clearly written out. One would expect that such a handout is an excellent example of appropriate framing. Interestingly, as was discussed in Chapter 6, one of the LEP students, Hoa, still wanted the teacher to frame the experience by explicitly doing the protocol required for one of the minerals, modeling the procedure. And, indeed, Teacher B spent considerable lab time that day walking Hoa through the protocol for one of the minerals, step by step, and repeating that procedure with the second of

three of the LEP students. These students' framing needs went beyond the oral or written form; they wanted to see the protocol acted out.

In my post-taping interview with Teacher A, he was particularly concerned with how much procedural conversation had to take place with the LEP students, especially regarding the lab experiments. "So much is just procedural; that really stands out with me. If I give an oral discussion in the class the LEP students always have to have a second interaction. How much can they be picking up?" In my discussion with Teacher A about how framing can help, he equated such a strategy with a motto he had learned in special ed training: "Q, do, review." Realizing that the technique and the principles behind the technique were similar, he speculated that "this could help; it gives the framework."

To summarize recommended framing strategies, what EP students hear in one utterance or in a second repetition, LEP students may miss. Important framing of topic, not only <u>what</u> the topic is, but <u>what about the topic</u> is being said will help the LEP students become more successful listeners. Additionally, in lab experiments, teachers may want to consider modeling the procedure.

<u>Research project summary</u>

This study was an analysis of native speaker teacher talk: its effect on the interactive role of non-native speaking adolescent students who have been mainstreamed into content classrooms. Building on the findings of Verplaetse, 1993, this work explored the existing claim that NS modifications (at the discourse level) are beneficial to the NNS. The findings of this study

indicated that NS teacher modifications did occur in the mainstream classroom. Teachers issued more directives to action to LEP students. The academic content questions asked to LEP students were more frequently closed questions rather than open-ended; and they were consistently of a lower cognitive level compared to those questions asked of the EP students. The consequence of these modifications was that the LEP students' opportunities to speak as purposefully as their EP classmates were restricted. This limitation of interactive opportunities diminishes the LEP students' opportunities to co-construct the ongoing knowledge in class discussion. It limits the LEP students' practice in orally producing extended, decontextualized, academic discourse needed to become proficient in the target language. Furthermore, it may reduce the face of the LEP students, defining their social roles in the classroom as less than their capabilities would allow.

Other teacher modifications to LEP students were identified which may be helpful to these students. Teachers called on (designated without student volunteering) LEP students proportionately more often than they did EP students. Apparently these teachers realized that the EP students volunteer more often; hence, if they are to promote LEP interaction, they realized they would need to "draft" these students onto the interactive floor. Additionally, the teachers made good use of referential questions with LEP students during small group work (lab time), ensuring at this time that these students understood what needed to be done in the small groups.

Four explanations for these modifications were suggested: 1) teachers' underestimation of LEP students' language abilities; 2) time constraints (class

time, wait time after a question, and time on topic); 3) a benevolent conspiracy, the wish to shelter the LEP students from embarrassment; and 4) LEP students' difficulty understanding what is being discussed.

The findings and the explanations indicate that content teachers are faced with a significant challenge as they attempt to find ways to engage LEP students who have been mainstreamed into "integrated" classrooms. Some readers may argue that these findings would support keeping LEP students in bilingual classrooms for longer periods, until they can function at native-like level of language proficiency. I would respond with two thoughts. First, no matter how proficient LEP students become in bilingual/ESL classrooms, at some point, they will need the "real" English-medium environment to fully perfect their skills, because it is in the English-medium classroom where EP students' discourse strategies and the consequential NS teacher - EP student discourse strategies are modeled. It is through this modeling and subsequent practice that LEP students can achieve competency. Second, given the various models of bilingual education that currently exist, the fact remains that LEP students are in content classrooms. If LEP students are to be integrated in content classrooms then this study has identified teaching strategies which will help these students more fully integrate into the classroom speech events.

As educators and researchers seek to resolve the social inequities linguistic minority children experience in the American school system, we may need to expand our current research/training agenda. If NS teachers are unwittingly reducing the interaction opportunities of LEP students, we may need to explore how NS content teachers can learn to alter their discourse

strategies in talk to LEP students to create more responsive and productive speech environments.

Appendix A: Coding for Initiation, Response, Feedback Moves & Acts

	MOVE	ACT	QUESTION TYPES	TURN ALLOCATIONS
Initiation/			H O U	G, G*, G>
Scaffold-	I/S:	elicitation:	L X K	P, P*
Initiation				SG, SG*
	I/S:	check		
	I/S:	directive		
Response	R:	reply *(answers, accepts, clues, comments)*		
	R:	prompt		
			H O U	G, G*, G>
	R:	elicitation:	L X K	P, P*
				SG, SG*
	R:	check		
	R:	directive		
Feedback	F:	accept *(repetition, paraphrasing, back-channels)*		
	F:	evaluate *(explicit or exaggerated tonal)*		
	F:	comment *(answer, clue, rhetorical & tag questions, expand, inform)*		
	F:	prompt		
			H O U	G, G*, G>
	F:	elicitation:	L X K	P, P*
				SG, SG*
	F:	check		
	F:	directive		
	F:	cue		

Also included: Coding for Questioning Types and How Turns are Allocated
Questions: Higher/Lower; Open/(X)Closed ; Unknown/Known
Turns: Whole Group, Small Group, Individual Person -
* = designated without volunteering; > = self-selecting

Appendix B: Miscellany Coding Instructions

Repeated utterances:

1. If student loops with a "what?" or "repeat", or issues a confirmation request, by repeating T's words with an upward intonation do not count teacher's repeated response. If student paraphrases in a confirmation question and teacher repeats but adds additional or new information, treat T's response as an R:rep.

2. If Teacher immediately repeats an elicitation after first offering to the entire group, this time naming an interlocutor, treat the first question as the elicitation, the second question with name as a nomination. However if new propositions are added to the second question, count as its own question.

3. Identical and immediate repeats within turn are not counted as a second act.

Nominating acts:

4. If a question has already been issued and a transaction has occurred, and teacher nominates a new student by calling out the student's name, but not repeating the question, code as a nomination.

5. If student bids for floor by raising hand and teacher gives student the floor by saying something like, "Sam, do you have a question?", treat this act, not as an elicitation, rather code as a nomination.

Transaction initiations:

6. Every transaction will be initiated by an "I" or a "nom." or by a student "self-selecting".

7. At the beginning of a transaction, a teacher may issue several acts before student responds, to include comments, checks, directives, and an elicitation. Treat all as part of the Initiation move. After student responds, the acts become R, S, or F.

8. If a topic has been developed by a student's questions and teacher's replies, and then the teacher issues an elicitation, treat the el. as an S or F, although no I has been issued in this transaction.

9. Should a teacher change topic in the middle of a transaction by issuing a new elicitation on a distinctly different topic, code as an I. S's build on a given topic, challenging further an existing, correct thought.

Cues:

10. When it is teacher's turn to follow-up on a student response, but instead teacher opens floor to group with an utterance such as "What do you think?" or "Do you agree", treat as a F:cue.

11. If student issues a question, and teacher opens the question up to the group, or nominates another to answer the question, do not treat as an R:0; rather code as an R:cu.

Other:

12. Sometimes teacher uses "OK" or "right" in a full-class discussion, but is not really checking to see if the group understands, rather s/he is holding the floor and allowing students' thoughts to be processed. S/he too is processing for ongoing move. It's a marker that says "process this"; code as M for marker.

13. In response to a student's question, if a teacher answers "yes" or "no" directly, followed by further comment, treat the yes/no as one act and the following comments as a second act.

14. "Str." includes false starts.

Appendix C: Relationships of Question Types

	Teacher A	Teacher B	Teacher C	Total
Question Frequency				
High + Open	64	23	46	133
High + Closed	16	5	7	28
Low + Open	35	56	27	118
Low + Closed	49	139	50	238
Significance:	χ^2=23.59 p=.0001	χ^2=28.25 p=.0001	χ^2=32.04 p=.0001	χ^2=106.61 p=.0001

Table C.1
Relationship of Cognitive Levels of Questions and Open/Closed-Ended Questions

	Teacher A	Teacher B	Teacher C	Total
Question Frequency				
High + Display (K)	42	20	45	107
High + Referential (U)	38	8	8	54
Low + Display (K)	67	143	14	224
Low + Referential (U)	17	52	63	132
Significance:	χ^2=12.46 p=.0004	χ^2=2.34 p=.98	χ^2=53.72 p=.0001	χ^2=.459 p=.4982

Table C.2. Relationship of Cognitive Levels of Questions and Display (answer-known)/ Referential (answer-unknown) Questions

	Teacher A	Teacher B	Teacher C	Total
Question Frequency				
Open + Display (K)	56	61	43	160
Open + Referential (U)	43	18	30	91
Closed + Display (K)	53	102	16	171
Closed + Referential (U)	12	42	41	95
Significance:	χ^2=9.887 p=.0017	χ^2=.757 p=.3843	χ^2=11.06 p=.0009	χ^2=.001 p=.971

Table C.3. Relationship of Open/Closed-ended Questions and Display (answer-known)/ Referential (answer-unknown) Questions

Appendix D: Directions for Mineral Lab: An Example of Framing

NAME _____ DATE 4/25 SCORE _____

INTEGRATED SCIENCE

LABORATORY EXPERIMENT

INVESTIGATING MINERALS
CHEMICAL & PHYSICAL PROPERTIES

PROBLEM: TO DETERMINE THE CHEMICAL AND PHYSICAL PROPERTIES OF TEN MINERALS.

MATERIALS: HYDROCHLORIC ACID (HCL), MAGNET, STREAK PLATE, NAIL, GALENA, MICA, HALITE, CALCITE, PYRITE, HEMATITE, TALC, MAGNETITE, GRAPHITE, AND QUARTZ.

PROCEDURE:

1. TEST ALL THE SAMPLES FOR A REACTION WITH HCL. IF THEY REACT (BUBBLE), PLACE A **YES** IN COLUMN 1; IF NOT, PLACE A **NO**.
2. TOUCH THE MAGNET TO EACH SAMPLE. IF THE SAMPLE IS ATTRACTED TO THE MAGNET PLACE A **YES** IN COLUMN 2; IF NOT, PLACE A **NO**.
3. RECORD THE ACTUAL COLOR OF THE SPECIMENS IN COLUMN 3.
4. RUB EACH SAMPLE ON A CLEAN STREAK PLATE, RECORD THE ACTUAL COLOR OF THE STREAK POWDER IN COLUMN 4.
5. USING THE NAIL, SCRATCH THE MINERAL. IF THE MINERAL IS HARDER THAN THE NAIL RECORD **H.N.** IN COLUMN 5; IF THE MINERAL IS SOFTER RECORD **S.N.**.
6. IN COLUMN 6, RECORD ANY STRIKING CHARACTERISTICS YOU MAY HAVE OBSERVED IN EACH ROCK SAMPLE.

OBSERVATIONS:

ROCK SAMPLE	ACID (1)	MAGNETIC (2)	COLOR (3)	STREAK (4)	HARDNESS (5)	COMMENTS (6)
1. GALENA						
2. MICA						
3. HALITE						
4. CALCITE						
5. PYRITE						
6. HEMATITE						
7. TALC						
8. MAGNETITE						
9. GRAPHITE						
10. QUARTZ						

Appendix E: Glossary

academic language — The language used in school as compared to the language used for interpersonal conversation. What comprises academic language is yet to be fully described. The literature claims that reaching competence in the academic language of a second language requires 5-7 years; while basic conversational competence can be reached in two years.

accept — A Follow-up speech act, the function of which is to indicate that the teacher has heard the student's utterance. This act may be realized by a repetition, a paraphrasing, or a back-channelling.

check — A speech act found in all four moves, the function of which is to determine if a student is prepared, ready to take part in an exchange.

clarification request — A discourse strategy whereby a speaker, who suspects s/he has misunderstood, asks of a conversation partner to repeat or rephrase his/her previous utterance.

closed question — The type of question with elicits a short, closed response, to include yes/no questions, either/or questions, or fill-in-the-blank type questions requiring no more than one or two word answers.

comment — A speech act found in Follow-up moves, the function of which is to either provide an answer or clue, offer a rhetorical or tag question, expand on a student's utterance, or provide additional information.

communication unit — Independent grammatical predication, same as T-unit but can include ellipsis in oral production.

competence — Abstract knowledge about the grammaticality of sentences, the structural relationships among sentences, or the regularities of discourse structures. "Competence" is used in sharp distinction to "performance", which is the production of language, subject to variability.

comprehension check — A discourse strategy whereby a speaker issues a question of his/her partner to ensure that understanding has occurred, such as "Do you understand?"

confirmation check — A discourse strategy whereby the speaker repeats what the previous speaker has said with a questioning intonation as if to ask, "Do I understand you correctly?"

content classroom — The classroom in which a particular discipline is taught; that is, science, or math; as distinct from a "grade 3" classroom in which a variety of subject is taught.

cue — A speech act in response to a student's answer; the function of which is to open the floor to the class, thus allowing a student to provide the feedback.

dialogic discourse — An interactive style in which one speaker builds his/her thoughts and utterances from a previous speaker's utterance, and this utterance then becomes the springboard for a new question or idea.

directive to action — A speech act found in all four moves, the function of which is to request a non-linguistic response.

display question — A type of question, the answer to which is known.

elicitation — A speech act found in all four moves, the function of which is to request a verbal response.

expansion — A discourse strategy whereby a speaker expands on a previous utterance, adding additional information.

evaluation — A Follow-up speech act, the function of which is to comment on the quality of the student's response. In this study, only explicit evaluative comments or highly exaggerated tones are coded as evaluation.

Follow-up move — One of four teacher moves, the function of which is to respond to a student's utterance; also call a Feedback move.

foreigner talk — A term used to describe the unique register of talk used by a native speaker when speaking to a non-native speaker.

Initiation move — One of four teacher moves, the function of which is to initiate an exchange with a student.

input — Language that is heard or received by the hearer or reader. Most often this term is used in reference to language that is received by a language learner.

integrated classroom — The classroom which contains students who have previously been preparing in "special" classrooms, to include: ESL classrooms, bilingual classrooms, and special education classrooms. In this paper, "integrated" is used to describe only the make-up of the student population; it does not imply instructional styles.

LEP student — Limited English proficient student, that is, a student for whom English is not the first language; furthermore this student is identified as still being in a transitional state regarding his/her English development. See footnote, p.8.

linguistic minority — Those speakers who speak a first language other than the dominant language of the community; in this paper, "linguistic minority" refers to the students for whom English is a second language.

NS — Native speaker; in this study, NS refers only to native English speaker.

NNS — Non-native speaker; in this study, NNS refers only to non-native speakers of English.

negative face needs — The need to be unimpeded; this is the traditional perspective of politeness, based on politeness strategy theory of Brown & Levinson, 1978, 1987.

open-ended questions — Those questions which allow for an long, extended answer.

other-repetition — A discourse strategy whereby a speaker repeats the utterance of the previous speaker.

output — Language that is produced by the language learner, either orally or in written form

participant structures — Conventional configurations in the discourse that regulate the interlocutors' roles within a given speech event. These configurations mark uniquely one speech event from another.

positive face needs — The needs to be ratified, understood, approved of, accepted, or liked, based on politeness strategy theory of Brown & Levinson, 1978, 1987.

prompt — A speech act in response to a student's question or student's statement, the function of which is to reinforce that the teacher is no longer requesting an answer by expecting one.

referential question — A type of question, the answer to which is unknown; also described as a real or sincere question.

repair work — Conversational turns that occur because of miscommunication or misunderstanding. The conversation work required to clear up a misunderstanding. Repair work includes the following discourse strategies: confirmation checks, comprehension checks, and clarification requests. Also often included are self-repetitions and other-repetitions.

reply — A speech act in response to a student's question, the function of which is to either answer the question, acknowledge the question, provide a clue or a comment.

Response move — One of four teacher moves, the function of which is to respond to a student's question.

Scaffold-initiating move — One of four teacher moves, the function of which is to immediately initiate further interaction, after a teacher and student have satisfactorily completed an informational exchange.

scaffolding — The helping of a child in that child's thought process by moving the child forward in the learning

experience by allowing the child to create as much as s/he can and then guiding that child to the next step of development. Three distinct types of scaffolding are described in this study: 1) reformulating - a response to a student error or to an insufficient student answer; 2) a question in response to a student's own question, thus reversing the direction of inquiry; and 3) a question to initiate further challenge for a student, to further develop a student's correct line of thinking.

self-repetitions — A discourse strategy whereby a speaker repeats what s/he has just said.

speaker rights — Those rights to speak as frequently and as purposefully as one's peers or as one's role in a speech event dictates.

transaction — For this study, transaction is defined as an interaction between the teacher and a specified student interlocutor. The transaction may contain one or more exchanges between teacher and student.

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Tobin, K., & Gallagher, J. (1987). The role of target students in the science classroom. Journal of Research in Science Teaching, 24(1), 61-75.

van Lier, L. (1988). The classroom and the language learner: Ethnography and second-language classroom research. London: Longman.

Verplaetse, L. (1993, April). Modifications in native speaker input: A hindrance to L2 production. Paper presented at American Association of Applied Linguistics Conference, Atlanta, GA.

Wertsch, J.A., & Toma, C. (1990, April). Discourse and learning in the classroom: A sociocultural approach. Paper presented at University of Georgia, Visiting Lecturer Series on Constructivism In Education, Athens, GA.

Wilson, J. (1989). On the boundaries of conversation. Oxford: Pergamon Press.

Woods, A., Fletcher, P., & Hughes, A. (1986). Statistics in language studies. Cambridge: Cambridge University Press.

Zanger, V. (1991). Social and cultural dimensions of the education of language minority students. In A. Ambert (Ed.), Bilingual education and English as a second language. A research handbook 1988-1990 (pp. 3-54). New York: Garland.

Zuengler, J. (1993). Encouraging learners' conversational participation: The effect of content knowledge. Language Learning, 43(3), 403-432.

Loretta (Lorrie) Stoops Verplaetse
201 Maple Street
Attleboro, MA 02703
(508) 222-3483

EDUCATION

BOSTON UNIVERSITY
Ph.D. Program of Applied Linguistics.
Specialized interests: NS-NNS interaction, Second Language Acquisition, and the Effects of Bilingualism and Language Variances on Academic Performance.
Completion date: January, 1995.
Boston, Massachusetts. 1987 - Current

SYRACUSE UNIVERSITY
M.S. Ed. in Foreign Language Education.
N. Y. State Permanent Teacher Certification. (grades 7-12)
Syracuse, New York. 1974

UNIVERSITY OF ILLINOIS
B.A. in Liberal Arts (Languages), graduated with High Honors. Russian major, German minor.
University James Scholar.
Urbana, Illinois. 1971

LOYOLA UNIVERSITY OF CHICAGO
Courses to include Psychology of the Urban Student, and English as a Second Language.
1971

ACADEMIC EXPERIENCE

TEACHING

CLARK UNIVERSITY Worcester, Massachusetts. 1990 - Current.
Adjunct faculty member teaching graduate courses in TESOL Certificate Program. Courses included: TESOL Methods, Introduction to Linguistics, and Capstone Research Seminar. Invited by Clark faculty as a direct result of this instruction to train teachers in Northern Bohemia, Czechoslovakia during the summer of 1991.

BOSTON UNIVERSITY Boston, Massachusetts. Fall, 1988 & Summer, 1990.
Adjunct faculty member teaching graduate TESOL Methods course for public school teachers (Edco Project) and Introduction to Language Acquisition graduate/ undergraduate course. Received such high evaluations in the Methods course for content and presentation style that I was recommended and invited to train teachers for the American Schools in Costa Rica (January, 1989).

FRAMINGHAM STATE COLLEGE Framingham, Massachusetts. January, 1989.
Visiting Faculty member teaching TESOL Methods graduate course for the International Master's Program at Collegio Lincoln, San Jose, Costa Rica.

UNIV. OF MASSACHUSETTS DARTMOUTH N. Dartmouth, MA. 1979 - Current.
During my tenure as a counselor and director of the university's alternative admission program for "disadvantaged" youth, I have taught undergraduate ESL courses for the English Department (fall, 1981), ESL in summer prep programs (1980 - 1984), and student success courses for freshmen (1988-1991). In addition, I have taught short-term ESL courses to visiting Japanese university students through the INTRAX program hosted by the university (1986-1988).

RHODE ISLAND STATE EDUCARE, INC. Pawtucket, Rhode Island. 1977 - 1978.
Adult Basic Educator designing curriculum and instructing ESL, GED, and literacy.

PUBLIC SCHOOL SYSTEMS Attleboro, Massachusetts. 1975 - 1977.
Liverpool, New York. 1973 - 1974.
Substitute Teacher, grades 7-12. Foreign Languages and Language Arts.
Short term and long term assignments.
Certified New York State to teach Russian and German, grades 7 - 12.

TRAINING

UNIV. OF MASSACHUSETTS DARTMOUTH N. Dartmouth, MA. 1979 - Current.
During my tenure with the university's alternative admission program, I have provided training for the following programs:
Cooperative Learning Center: ongoing tutor training in the areas of ESL and Multi-Cultural Sensitivity (1981-current);
Dept. of Labor Education: program design, curriculum development, and staff training for Workplace Literacy project (1987 - 1988);
Division of Continuing Studies: tutor training for High School Literacy program (1991);
New England TRIO Training Program: provided organizational development training for directors and staff in disadvantaged student programs at colleges throughout New England as part of a team of trainers through a U.S. Dept. of Education Grant. (1984).

LORRIE VERPLAETSE & ASSOCIATES Attleboro, MA. 1980 - 1988.
Consultant to business, industry, labor, and education on issues of ESL, cross-cultural communication, literacy, and training the hourly worker. Clients to include: Balfour's, UMass Dartmouth, Hasbro, and TJ Maxx (through Quinsigamond Community College).

ADMINISTRATION

UNIV. OF MASSACHUSETTS DARTMOUTH N. Dartmouth, MA. 1979 - Current.
Director of university's Alternative Admissions Progam for students with 1) low income; 2) linguistic minority, or 3) ethnic minority status. Coordinate the curriculum development for program's fall academic semester, to include: establishing and maintaining strong linkages with academic departments; assisting in the design and introduction of two of the main courses – a reading development course and a student success course; and consulting with the faculty on instructional methodology issues for this special student population. Responsible for a yearly budget of over $250,000. Supervise a full-time staff of five.

LITERACY VOLUNTEERS OF AMERICA Attleboro, Massachusetts. 1977 - 1978.
As affiliate organizer, developed and directed a community adult educational program in ESL and literacy, to include: staff supervision, training of tutors, promotional activities, and budget management.

LOYOLA UNIVERSITY OF CHICAGO Chicago, Illinois. 1972.
Staff Assistant for Teacher Placements in the Career Planning and Placement Office.

RESEARCH

"Modifications of Politeness Strategies and Personal Detail in Native Speaker Input to Non-Native Speakers." MS. Boston University. 1992.

"Test Item Reading Strategies of Monolingual and Bilingual Poor Readers: A Diagnosis." MS. Boston University. 1993.

"Discourse Modifications in Native Speaker Teacher Talk: Their Effects on the Interactions of Limited English Proficient Students in Content Classrooms." Dissertation in Progress. Boston University. 1994.

PRESENTATIONS

"Teaching Strategies for the Linguistically Diverse Classroom." faculty/staff development workshop, University of Massachusetts Dartmouth, August, 1993.

"Interactive Modifications by Native Speakers: A Hindrance to L2 Production." Pragmatics & Language Learning Conference (refereed), University of Illinois, April 3, 1992.

"Modifications in Native Speaker Input: A Hindrance to Interaction." Designing Our World, TESOL '93 National Conference (refereed), Atlanta, Georgia, April 13, 1993.

"Modifications in Native Speaker Input: A Hindrance to L2 Production." American Assoc. for Applied Linguistics Conference (refereed), Atlanta, Georgia, April 19, 1993.

"TESOL Methods" and "Beginning ESL for Children," guest faculty member for two 10-day intensive immersion programs; Litomerice School District, Sutom, Czechoslovakia, August, 1992.

"Language Variance and its Effect on Academic Performance." faculty/staff development workshop, Southeastern Massachusetts University, August, 1988.

"Training the Hourly Worker: How to Make the Content 'Learnable.'" invited speaker for American Society for Training and Development NE Regional Conferences, 1985 & 1987, and for the Mass. Chapter and the Rhode Island Chapter, 1987 & 1988.

"Speaking English on the Job." Co-Presenter, Matsol Fall Conference, Boston, MA., 1986.

PUBLICATIONS

"English Encounters of the Third Kind," Data Training Magazine, April, 1988.

"English in the Garment Shops," locally published by Arnold Dubin Labor Ed Center and Amalgamated Clothing and Textile Workers Union/ ILG, an ERIC document, 1986.

"Illiteracy - How to Help," Employer Services Digest, Vol.3, No. 8. March, 1985.

"Basic Training; A Quarterly Communication Regarding Education in Business, Industry, and Labor," desktop publication for New England production and personnel managers, L. Verplaetse & Assoc., 1984 - 1985.

RECOGNITIONS

1994 Awarded J. William Fulbright Grant to Lecture in TESOL/ Applied Linguistics in Czech Republic, University of Western Bohemia, Plzen. Spring, 1995.

1992 Invited member of Advisory Board for New Bedford, MA "Talent Search" TRIO-funded early awareness program for disadvantaged high school youth.

1989 Appointed Co-Chair, in charge of programming, for the Boston University 14th Annual Conference on Language Development, an internationally renowned conference for linguists organized by the BU Dept. of Applied Linguists.

1987 Invited member of Advisory Board for Massachusetts' Governor Dukakis' Commonwealth Literacy Corp.

1970 Inducted into "Dobro Slovo", National Slavic Honor Society.

1969 Awarded University of Illinois James Scholar

AFFILIATIONS

TESOL: Teachers of English to Speakers of Other Languages.
MATSOL: Massachusetts Chapter of TESOL.
ASTD: American Society of Training and Development, 1984.
RIASTD: Rhode Island Chapter of ASTD, 1984 Chapter Vice President , 1982 - 1985.
LAANE: Learning Assistance Association of New England.
AAAL: American Association of Applied Linguists.
LSA: Linguistic Society of America.
ACAFAD: National Association of Academic Affairs Administrators.